A STUDY ON PREVALENCE OF PREVENTABLE SKIN DISEASES AND THEIR RISK FACTORS AMONG HOUSEHOLDS IN SELECTED SLUMS OF CHENNAI, TAMIL NADU – 2014

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M.D. BRANCH XV

COMMUNITY MEDICINE

THE TAMIL NADU Dr. MGR MEDICAL UNIVERSITY,

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CERTIFICATE OF THE GUIDE

This is to certify that the dissertation titled **"A STUDY ON PREVALENCE OF PREVENTABLE SKIN DISEASES AND THEIR RISK FACTORS AMONG HOUSEHOLDS IN SELECTED SLUMS OF CHENNAI, TAMIL NADU – 2014"** is a bonafide work carried out by **Dr. A. EVANGELINE MARY**, Post Graduate student in the Institute of Community Medicine, Madras Medical College, Chennai-3, under my supervision and guidance towards partial fulfillment of the requirements for the degree of M.D. Branch XV Community Medicine and is being submitted to The Tamil Nadu Dr.M.G.R. Medical University, Chennai.

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I, solemnly declare that the dissertation titled **"A STUDY ON PREVALENCE OF PREVENTABLE SKIN DISEASES AND THEIR RISK FACTORS AMONG HOUSEHOLDS IN SELECTED SLUMS OF CHENNAI, TAMIL NADU – 2014",** was done by me under the guidance and supervision of **Dr.V.V.Anantharaman**, **B.Sc., M.D., M.Med., M.B.A., D.P.H., D.D.,** Director, Institute of Community Medicine, Madras Medical College, Chennai-3. The dissertation is submitted to The Tamil Nadu Dr. M.G.R. Medical University towards the partial fulfillment of the requirement for the award of M.D. degree (Branch XV) in Community Medicine.

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ABBREVIATIONS

BMI	–	Body Mass Index
CDC	–	Centre for Disease Control and Prevention
CHC	–	Community health centre
DALY	–	Disability Adjusted Life Years
DEIC	–	District Early Intervention Center
DH	–	District Hospital
GBD	–	Global Burden of Disease
GHC	–	Global Hygiene Council
HABIT Study	–	Hygiene: Attitudes, Behavior, Insight and Traits study
HANES-1	–	First US National Health and Nutrition Examination Survey
HPV	–	Human Papilloma Virus
JMP	–	Joint Mission Program
NFHS	–	National Family Health Survey
NRHM	–	National Rural Health Mission
NS	–	Not significant
NSS	–	National Sample Survey
OP	–	Out Patient Department
OR	–	Odds Ratio
PHG	–	Palestinian Hydrology Group
PR	–	Prevalence Rate
RBSK	–	Rashtriya Bal Swasthya Karyakram
RGGGH	–	Rajiv Gandhi Government General Hospital

S	–	Significant
SES	–	Socio economic status
TSD	–	Transmissible skin diseases
UNICEF	–	United Nations’ Children's Fund
UN-Habitat	–	United Nations Human Settlements Programme
US	–	United States
WASH	–	Water Sanitation And Hygiene
WATSAN	–	Water and Sanitation
WHO	–	World Health Organization

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ABSTRACT

A STUDY ON PREVALENCE OF PREVENTABLE SKIN DISEASES AND THEIR RISK FACTORS AMONG HOUSEHOLDS IN SELECTED SLUMS OF CHENNAI, TAMIL NADU – 2014

Background:

In developing countries, skin diseases have a serious impact on people's quality of life and bring out a significant burden to the nation. They have a high morbidity but very little mortality and are neglected both by the community and the health personnel. Preventable skin diseases are those infections and infestations of the skin that can be avoided by good hygiene practices and by improving the living conditions of the individuals. According to WHO, these diseases have the greatest importance in terms of public health. The prevalence of skin diseases in population based studies conducted in India vary from 14% to 50%. Simple approaches like promoting hygiene in the community, improving their housing standards, preventing overcrowding, better health education and improving the socioeconomic status of the community may bring down the burden of these skin diseases drastically.

Objectives:

To estimate the prevalence of preventable skin diseases and its risk factors among individuals residing in households in the selected slums of Chennai in 2014.

Materials and methods:

A community based cross sectional study was done among households in the slums of Chennai during February to May 2014. 520 individuals residing in 107 households were selected by multistage cluster sampling method. In each household, all the members were selected for the study. History related to their hygiene practices was obtained using a pretested semi-structured questionnaire and head to foot examination of skin and its appendages was done indivudually in day light to assess their general appearance and to find out the presence of preventable skin diseases.The association between various factors and skin diseases were analyzed by using Chi Square test.

Results:

The members in each household ranged from 1 to 10. More participants were in the 30 to 39 years age group and females were more compared to males. The study revealed the overall prevalence of preventable skin diseases was 86% among households and 46.3% among individuals (95% CI - 42.01% to 50.59%). The most common skin diseases were the parasitic infestation (43.9%) followed by fungal infection (42.50%) with pediculosis capitis (35.4%) being the most common diagnosis. Preventable skin diseases were significantly higher in children and adolescents and also among females. 90.6% households were overcrowded, 84% individuals share their sleeping place with others, 41.7% participants did not take bath daily, 65% participants shared their soaps, 68.5% individuals shared their towels, 73.3% participants shared their combs and hand washing practices of the individuals were very poor. A significant association was found between preventable skin diseases and type of house, overcrowding, frequency of taking bath, application of oil to body, place of taking bath and poor general appearance.

Conclusion:

Alarming prevalence of preventable skin diseases of 46.3% among individuals and 86% among households highlights the need for screening programmes for slum dwellers for early diagnosis of skin diseases. Health education interventions should be given to improve the hygiene practices among households in the slums.

Key words: Preventable skin diseases, Households, Prevalence, Slum.

1. INTRODUCTION

In developing countries, skin diseases have a serious impact on people's quality of life and bring out a significant burden to the nation. Majority of the skin diseases are not life threatening but have a very strong social stigma. They have a high morbidity but very little mortality and are neglected both by the community and the health personnel.

The pattern and prevalence of skin diseases in any country or region depends on various factors, such as genetics, racial constitution, cultural and socio-economic factors related to the hygiene standards and treatment-seeking behavior, their customs and occupations.

Skin disease poses a huge burden in the global context of health. Global Burden of Disease (GBD) Study 2010 stated that collectively skin conditions were the 4th leading cause of nonfatal burden expressed as years lost due to disability and based on disability-adjusted life years (DALYs), skin diseases remained the 18th leading cause of health burden worldwide. The burden due to skin infection highlights the impact of poverty. Fungal skin diseases were the 4th most prevalent disease and impetigo, molluscum contagiosum, warts and scabies were among the top 50 diseases globally.[1]

1.1 Preventable skin diseases

Poverty and disease are closely tied together in a vicious downward spiral, with each factor aiding the other. Many diseases that primarily affect the poor serve to deepen poverty and also worsen conditions. Poverty in turn, significantly reduces people capabilities making it more difficult to avoid poverty related diseases. WHO calls them "diseases of poverty" because they primarily affect the poor, and they also worsen poverty's toll.[2]

Majority of the diseases in poor countries are due to preventable, treatable diseases for which medicines, treatment regimes and preventive approaches are readily available. In many cases, poverty is the single most dominating factor in the higher rates of prevalence of these diseases. Poor hygiene, non-availability of safe water, inadequate nutrition and ignorance in health-related education are factors that are exacerbated by poverty.

Skin disease refer to disorders of exclusively (or predominantly) the superficial layers of the skin. Preventable skin diseases are those infections and infestations of the skin that can be avoided by good hygiene practices and by improving the living conditions of the individuals. According to WHO, these diseases have the greatest importance in terms of public health.[3] Most of these diseases can be easily transmitted from one person to another. They form part of Sanitation and Hygiene related skin diseases and Poverty related skin diseases (based on CDC's Global WASH related diseases). They include parasitic infestations (head lice, scabies), fungal infections (dermatophytosis, pityriasis versicolor), bacterial infections (impetigo, folliculitis, carbuncle, furunculosis, intertrigo, ecthyma, leprosy) and viral infections (warts, molluscum contagiosum).

These skin diseases are the consequences of lack of health awareness, illiteracy, poverty, overcrowding, poor hygiene, poor access to water, hot and humid climatic conditions, high interpersonal contact and social backwardness.[4,5] Simple approaches like promoting hygiene in the community, improving their housing standards, preventing overcrowding, better health education and improving the socioeconomic status of the community may bring down the burden of these skin diseases drastically.[6]

It has been proved that without focusing on the public health aspects of dermatology and the community- oriented approaches, the overall skin health status will never improve.

Hence many developed and developing countries have given their maximum effort to develop primary care dermatology services. [3]

In India, there is a rapid spurt in the incidence and prevalence of transmissible skin diseases due to the epidemiologic transition fuelled by underdeveloped economy, social backwardness and globalization, which has led to rapid urbanization, major lifestyle changes, low hygiene, poor access to water, overcrowding, high interpersonal contact and hot and humid climatic condition. Children, adolescents, young adults as well as old persons are susceptible to skin infections. [7]

1.2 Slums

Since 1950, the urban population has grown from under 17% of the entire world's population to approximately 50% in 2000 AD.[5] UNICEF states that 90% of the future population growth will be in the urban areas and most of the growth is likely to be among the poor. UN-Habitat states that in 2014, 863 million people were estimated to live in slum conditions representing about one third of the world's total urban population.[8] Vast majority of these slums (more than 90%) are located in cities of developing countries.[5]

According to the Census of India, a slum is a compact area with at least 300 population or about 60-70 households of poorly built congested tenements, under unhygienic environment, usually lacking in proper drinking water and sanitary facilities with inadequate infrastructure.[9] In common words, we can say that slum is an overcrowded area of city or town usually formed by the poor for habitation.

According to the data released by the Registrar General and Census Commissioner's office in 2011, 17.4% of urban Indian households live in slums which comes up to roughly

1.37 crores households. The proportion of slum households residing in Chennai was 28.5% and 30-40% of Chennai population live in slums.[10]

1.3 Problems faced by Slum dwellers

Slum dwellers always experience difficult socioeconomic conditions that manifest in different forms of deprivation like material, physical, social, and political. They live in poorly constructed, overcrowded houses, often with insecure land possession. Housing in these types of settings range from high-rise tenements to shacks to plastic sheet tents on sidewalks, often located in undesirable parts of the city.[11]

The health of these slum dwellers is further affected by reduced access to safe water and food, poor sanitation, a breakdown of traditional family structures, high unemployment and high crime rates. Due to the high population density, overcrowding, lack of safe water and sanitation systems and unhygienic living conditions contrary to all norms of planned urban growth, slums are productive breeding grounds for transmission of various skin diseases. Most of the health problems as well as environmental issues are generated from slums. Despite the tremendous need, it is generally difficult to access healthcare services in these areas. It is estimated that, on an average, the slum population residing in cities have about 50% of all its diseases.[12]

Most of the studies on skin diseases are hospital based and they provide a very crude indication of its prevalence and incidence in the community. This study is done to detect the various preventable skin diseases and thereby the prevalence and the status of hygiene of the slum community. Health education on improving their hygiene and sanitation practices will definitely help to improve the health status of households.

Objectives of the study

2. OBJECTIVES OF THE STUDY

1. To estimate the prevalence of preventable skin diseases among individuals residing in households in the selected slums of Chennai 2014.

2. To identify the various risk factors associated with the preventable skin diseases among the same study population.

Justification

3. JUSTIFICATION

1. Preventable skin diseases are very common and collectively account for around 70% of consultations in primary and secondary care. So ignoring them is not a viable option.[12]A major reason for targeting these skin diseases is that most of them are transmissible and therefore potentially preventable and controllable.

2. The urban population in the world is rising. It is estimated that more than 60% of the increase in the world's urban population over the next three decades will be in Asia, mostly in China and India.[13] 90 % of the slum population reside in cities[5] and on an average, the slum population residing in cities have about 50% of all its diseases.[12]

3. Up to 80% of the population suffering from skin problems do not seek medical help. Knowledge of this hidden section of population is important as it can affect the delivery of health care.[14]

4. If left untreated, morbidity is significant leading to persistent symptoms such as intractable itch, disfigurement, disability, secondary infection, which could be very severe resulting in cellulitis and septicemia leading to reduction in quality of life and social deprivation.[15]

5. Just by providing simple measures like health education to improve hygiene of the slum population, we can definitely reduce the prevalence of these preventable skin diseases among households drastically.

6. Only a few populations based epidemiological studies measuring the prevalence of skin diseases in households exist and we know very little about the magnitude and

burden of skin disease among households at population level. Such knowledge forms an essential step in population-based needs assessment.

7. There is a lack of information about pattern of skin diseases among households in urban slum population in South India, especially in Tamil Nadu.

In light of the communicability of skin diseases without early detection, treatment and primary prevention, this study was proposed to conduct to fill this lacuna.

Review of Literature

4. REVIEW OF LITERATURE

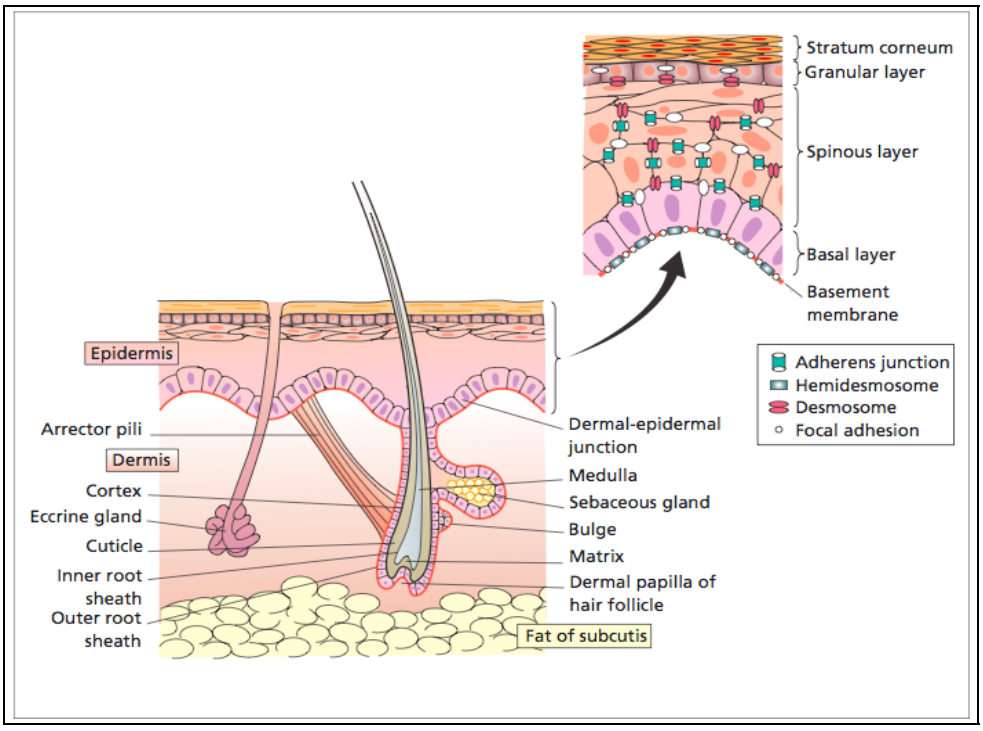
4.1 Introduction

4.1.1 Structure of the skin:

The skin is considered to be the largest organ in the body. The skin covers the entire body, with a surface area of 1.5 to 2 square metres, weighing 4-5 kg (9-11 pounds) accounting for about 7% of total body weight in an average adult. It has been estimated that in every square centimetre (cm) of the skin there are 70 cm blood vessels, 55 cm of nerves, 15 oil glands, 100 sweat glands, 230 sensory receptors, with about half a million cells constantly dying and being replaced.[16] The skin has two main layers:

1) An outer epidermis and
2) An inner dermis [14]

Figure 1: Skin and its appendages [14]



4.1.2 Functions of the skin

The main functions of the skin are summarized below [15]

I. Protection:

The skin functions as physical barrier to microorganisms, as a barrier to chemical hazards, reduces potential for mechanical trauma, prevents dehydration, protects from excess UV exposure (via melanin) and acts as a surface film by providing antibacterial, antifungal activity, lubrication, hydration of skin surface, buffer of caustic irritants and blockade of toxic agents.

II. Sensation:

Skin acts as a sophisticated sense organ. Somatic sensory receptors detect stimuli that permit us to detect pressure, touch, temperature, pain and other general senses.

III. Movement without injury:

Skin permits change in body contours without injury.

IV. Excretion:

Skin helps in excretion of water, urea, ammonia and uric acid.

V. Vitamin D production (endocrine function):

Exposure of skin to UV light converts 7-dehydrocholesterol to cholecalciferol - a precursor to vitamin D. Blood transports the precursor to liver and kidney where vitamin D is produced.

VI. Immunity:

Phagocytic cells destroy bacteria. Langerhan's cell trigger helpful immune reaction working with ''helper T cells''.

VII. Homeostasis of body temperatures:

To maintain homeostasis of body temperature, heat production must equal heat loss; skin plays a critical role in this process.

1. Heat production.
    a- By metabolism of foods in skeletal muscles and liver.
    b- By the amount of muscular work being performed.
2. Heat loss-approximately 80% of heat loss occurs through the skin; remaining 20% through the mucosa of the respiratory, digestive, and urinary tracts.
    a. Evaporation-to evaporate any kind of fluid.
    b. Radiation-transfer of heat from one object to an-other without actual contact.
    c. Conduction-transfer of heat to any substance actually in contact with the body.
    d. Convection-transfer of heat away from a surface by movement of air.

VIII. Body odour

IX. Psychosocial (psychological development in and interaction with a social environment)

4.2 Dermatoepidemiology

Dermatoepidemiology refers to the study of the epidemiology of dermatological disorders. It emphasizes on the study of groups and the probability of occurrence of certain events.[17] Although epidemiology is as old as Hippocrates, it is still a relatively new field within dermatology. [18]

The initial epidemiological discoveries in dermatology can be traced to 1746 when James Lind concluded the relation between scurvy in sailors and dietary factors.[19] Joseph Goldberger, in 1914, observed that pellagra developed in patients admitted to the Georgia

state sanatorium and suggested that the absence of ‘essential vitamins’ (nicotinic acid) was the cause for pellagra.[20]

Ongoing care for patients with skin diseases can be optimized when the incidence and population prevalence of various skin diseases and the patient-related factors for these conditions are understood.

In a study in Turkey, Isil Inanir et al studied the prevalence of skin disorders among primary school children and the associated socio economic factors. Infectious dermatoses were frequently observed and socioeconomic conditions were related to the occurrence of these transmissible skin diseases, and it was found in the study that improving the socioeconomic conditions and education levels were essential to decrease the prevalence of these skin disorders.[21]

Clinical-based studies are limited only to the type of skin diseases presented by the patients. But dermatoepidemiological data from population based studies, helps the researcher to explore the factors that are associated with skin diseases, such as the relationship with socioeconomic status and demographic variables and to formulate standardized recommendations to treat the skin diseases prevalent there and to plan public health strategies intended to control the skin diseases.

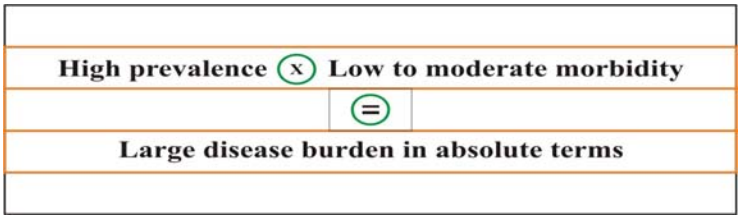
4.3 Skin disease: A major public health problem:

Studies have shown that relatively minor skin complaints often cause more anguish than other more serious medical problems to people. [22]

As skin diseases are so common, a little bit of morbidity affecting a lot of people can add up to far more than a lot of morbidity affecting only a very few people. It is this product

of high prevalence and moderate morbidity that makes skin diseases, very important from public health point of view. [14]

Figure 2: Skin disease as a major public health problem[14]:



In a study in Western Ethiopia among people of two rural communities, between 47 and 53 % of members claimed to have a skin disease, but when everyone else was examined, 67 % of those who denied of having skin problems were also diagnosed to have treatable skin conditions, most of which were infectious. [23]

There is a large iceberg of unmet dermatological need. Surveys have shown that approximately one-quarter of the population have skin problems, which could benefit from medical care; yet 80% of them do not seek medical help.[14] With increased public and professional awareness of effective treatment, this submerged sector of the population is likely to surface and place heavy demands on the current system.

4.4 Preventable Skin Diseases

Preventable skin diseases, also known as infectious diseases or transmissible diseases or communicable diseases, are illnesses that result from the infection, presence and growth of pathogenic (capable of causing disease) biologic agents on the skin of an individual human host. Certain diseases easily spread from one person to another through inadequate water supply, poor sanitation supplies, and overcrowding and unhygienic practices. These types of diseases have great importance in terms of public health.

The main disorders that are considered here belong to one of the following categories:

Table 1: Preventable skin diseases [3,24]

Classification	Skin conditions
Bacterial infections	Impetigo Folliculitis, Furunculosis Carbunculosis Ecthyma Intertrigo Leprosy
Ectoparasitoses	Scabies Pediculosis capitis
Fungal infections	Dermatophytosis Tinea (Pityriasis) Versicolor
Viral infections	Verrucae (warts) Molluscum contagiosum

4.5 Prevalence of skin disease

4.5.1 Global:

Data on the burden of skin diseases are scanty, even if available are of limited use in describing the burden of skin diseases in the community. Most of the morbidity data published refers to those who seek medical help in the medical care setting. So the extent to which the routine morbidity data reflect the dermatological need in the community is unclear.

The overall prevalence of skin diseases in a few population based studies conducted all over the world varied from 14 % to 50 %.[22,25–28] This variation may be due to variation in diagnostic criteria and study sample, study design and other variables.[18]

The First US National Health and Nutrition Examination Survey (HANES-1) during 1971-1974 by Johnson et al suggested nearly one-third had significant disorders with an

additional 12.5 % of the proportion with a skin condition that was clinically inactive during the time of examination.[14]

A study in the USA in 1999 by Federman et al determined the prevalence of patients with skin disease in all ages in a primary care setting and the likelihood of their referral to a dermatologist. At least one skin problem was present in 36.5% of patients, who presented to their primary care physician during the 2-year period. Diagnoses made by primary care physician were concordant with that of the dermatologists 57% of the times. The researchers thus concluded that patients frequently see their primary care physician for skin disease.[29]

In 2005, a cross-sectional community based household study was carried out between two urban areas of low and high socioeconomic status (A and B) in Basrah city in Iraq. The overall prevalence of skin disorders was 29.1 % in area (A) and 20.3% in area (B). The most common were the skin infections and infestation (bacterial, viral, fungal and parasitic), which constituted 23.9% of all the skin problems.[30]

In a study done among household women in three selected slums of Dhaka city in 2010, skin disease was present in 19% of the respondents and the slum women were not aware of their skin problem and they thought that they were normal skin conditions.[31]

Another study in 2013 among migrant slum women in Sylhet city of Bangladesh showed that 42% participants had skin diseases and it was associated with their poor sanitation and unhygienic practices.[32]

4.5.2 India

There are several studies on skin diseases in India, published before 2000 but there are only very few population based studies in the past 10-15 years. Most of them are

hospital-based studies,[33–35] done among special groups,[4,36,37] and in rural areas.[38–40] These studies do not portray the real prevalence of skin diseases at the community level.

In 2006, a one-year study on the morbidity pattern among the new patients attending the Rural Health Training Centre in Eastern Uttar Pradesh showed that skin diseases were found in 6.9% of the participants.[39]

A comparative study done on the dermatoses seen in the community health camps and a tertiary care centre in Kashmir by Hassan I et al between 2012-13, revealed that infectious dermatoses were more common in the community (34.08%) than in the tertiary care centre (29.42%), with fungal infections (40.7 %) being the most common type.[41]

A camp based study in a village near Kumble in Kerala showed that 11.16% of people had skin disease. Among them, 43.41% had cutaneous infections with fungal infections (22.92%) being the commonest infection.[38]

Table 2: Prevalence of skin disease in various Indian community based studies

Researcher	Study Population	Year of Study	Prevalence of skin disease	Most common skin disease
Sunil K Gupta[42]	Slum of Amritsar	1990	17%	Infections and infestations (70.26%)
Maria Kuruvilla[43]	Bantwal Taluq, a rural area from Karnataka.	1997	6.77%	Infective dermatoses (42.68%)
Goswami Mihir [44]	Slum areas in Ahmedabad	2000	3.9 %	Not mentioned
Rakesh K Ranyal[40]	Rural Allahabad	2005	7.86%	Infective conditions. (59.1%)

4.5.3 Tamil Nadu

A community based cross-sectional study in the Kancheepuram district of Tamil Nadu carried out among elderly population in 2003 showed that 12% of the participants had skin diseases.[45] Another study among elders in selected old age homes in Chennai in 2004 showed that skin diseases were present in 20.5% of the elders.[46]

A study done among primary school children in Government Schools of Chennai in 2011 showed that the overall prevalence of skin diseases was 59.3% with pediculosis capitis being the commonest one, which contributed to 27% of the total skin diseases.[47]

4.6 Prevalence of preventable skin diseases:

In a population study in Mexico in 1990 by a team of dermatologists and nurses among a sample of 50,000 households involving 41 representative communities in Guerrerro state, 50% of all the households had someone with a skin problem with scabies, pyoderma and pitryasis alba being the most common diagnoses.[48]

A population-based study among households conducted in 3 rural villages in Indonesia in 1999 showed the overall prevalence of skin diseases in 3 villages to be 28.2% with a 95% confidence interval of 24.6 – 31.8. The prevalence of fungal infections (12.0%) was found to be twice as high as dermatitis (5.1%). [28]

In a study on all new patients referred to a hospital in Southern Iran for a three-year period, among the 6841 patients referred, infectious and parasitic diseases were found to be the most common skin diseases accounting for 32.1% of the patients. [49]

4.7 Epidemiology of preventable skin diseases:

In a study in a tropical region of Acre State, Amazonia, Brazil, 9,955 school children of 6-16 years were examined. The prevalence of dermatosis varied from 21 to 87% in the

municipalities surveyed. The most common dermatoses were pediculosis (50%), nevi (16.8%), pityriasis versicolor (13.2%), pyoderma (12.2%), pityriasis alba (9.9%), dermatophytosis (6.2%), viral dermatosis (6.2%), scabies (3.0%) and acne vulgaris (2.7%). Urbanization, living conditions, socioeconomic situation and lack of hygiene were found to be the causes for such high prevalence and the association of two or more skin conditions. Study revealed that climatic conditions enhanced the prevalence of certain dermatoses like pityriasis versicolor and dermatophytosis.[50]

A survey of two village communities in Ngara district, North West Tanzania, involving 254 randomly selected households by Gibbs in 1996, found that 26.9% of patients had a treatable skin disease, and transmissible diseases comprised the bulk of skin disease (73.9%) with younger age groups being the most affected. Overcrowding was a major risk factor for the treatable skin diseases in that survey.[26]

A study on skin diseases among pilgrims presenting to a hospital during the Hajj season showed a high prevalence of eczema, intertrigo, fungal and bacterial infections which was due to hot humid overcrowded environment.[51]

A multicentric study by the WHO in 2005 showed that in all regions, the burden of scabies is associated with increased rates of pyoderma and complications of secondary bacterial infection with group A Streptococci and Staphylococcus aureus.[52] In a study in Fiji, children with scabies were 2.4 times more likely to have active impetigo lesions than children without scabies.[53]

A cross-sectional survey was done to assess the prevalence, morbidity and seasonal variation of pediculosis capitis and scabies in an urban slum and a fishing community in northeast Brazil. The prevalence of pediculosis capitis was 43.4% in the slum and 28.1% in

the fishing community and the most frequently affected were females and children aged 10–14 years. Scabies was present in 8.8% of the slum population and in 3.8% of the people in the fishing community and there was no consistent pattern of age distribution. In multivariate analysis, age less than15 years; female sex and living in the urban slum were independent factors that contributed to the simultaneous co infestation with scabies and pediculosis capitis. Data from longitudinal study in the urban slum showed a characteristic seasonal variation of pediculosis capitis, but there was no fluctuation of scabies.[54]

A cross-sectional study among male street children & adolescents of age 8 to 20 years showed the prevalence of infective skin diseases of 80% with pyoderma (41.7%) being the commonest. Significant difference was found between frequency of bathing and frequency of change of clothes with infective dermatosis. [55]

4.8 Epidemiology of individual preventable skin diseases:

4.8.1 Infestation:

Scabies and Pediculosis capitis are the two common highly contagious parasitic skin diseases caused by arthropods in the primary care setting. They occur in conditions of poor hygiene and overcrowding. Although accurate diagnosis, effective treatment and preventive measures are available, infestation with scabies and lice are pandemic, affecting millions worldwide.

A primary school survey on dermatologic needs and prevalence of treatable skin disease in children in southwestern Ethiopia was undertaken in schools in Shebe in October 1992. A team of dermatologists examined 112 children and 90 (80.4%) had one or more skin diseases. Treatable skin conditions were found in 98% of children. Infestations (81.2%) were most prevalent, followed by fungal infections (13.4%). The four common skin conditions were scabies, pediculosis capitis, tinea capitis, or pyoderma. [23]

4.8.1.1 Head lice (Pediculosis capitis):

The human head louse (Pediculus humanus capitis) has a world- wide distribution. Head louse infestation (Pediculosis capitis) is common both in developed and in developing countries. Precise data on current prevalence are relatively sparse. According to WHO, it is a problem of public health concern. It affects all ages, more commonly children and women. Transmission is by personal contact, sharing of combs, beds and pillows. [3,14]

The head louse typically infests the occipital portions of the scalp and sometimes the post auricular regions. Although few adults are present, many oval nits can be found cemented to the hair. Patients often complain of itching on the scalp. Cervical lymphadenopathy may be present. Diagnosis is made by direct visualization of the lice and the nits to the naked eye.[24]

A worldwide prevalence study of head lice was done by a thorough literature search of database. Most studies were from Asia and the prevalence varied from 0.7% to 59% with girls and women being more affected. Low socioeconomic status, poor hygiene and over-crowding were found to encourage the spread of lice. A statistically significant association was found between pediculosis capitis and size of household.[56]

A door-to-door survey done in a resource-poor urban community in Lima, Peru on 736 persons living in 199 households showed the prevalence of pediculosis capitis was 9.1%. Peak prevalence was found between 8-11 years. Head lice infestation was found to be significantly associated with young age, female sex, and household size with more than 4 persons, wooden houses and presence of animals in the household. [57]

Application of 1% gamma benzene hexachloride to the affected area is the treatment of choice. Two applications, a week apart is done to destroy nits. Personal cleanliness and

treatment of the source of infection is the treatment of choice. Patient education, daily bathing and no sharing of combs, beds, pillows, etc are useful preventive measures.[24]

4.8.1.2 Scabies:

Human mite causes scabies or "the classical itch". (Sarcoptes scabeii var hominis). Scabies is a major global public health problem in many indigenous and Third World communities. It occurs in both sexes, in all ages, all ethnic groups, and at all socioeconomic levels. Poverty and overcrowding are often concomitant, and overcrowding is said to have a significant effect on the spread of scabies, showing the role of physical contact in person-to-person transmission. Patients usually present with intense itching, which worsens at night with similar complaints among family members. Diagnosis is by clinical presentation of the lesion.[24]

A WHO review collated data from 18 prevalence studies between 1971 and 2001, reported a scabies prevalence ranging between 0.2% and 24%.[3]

An epidemiologic house-to-house survey conducted by Gulati et al in a semi urban area of Goa in India among 1,727 persons from 273 families living in 253 households, showed the prevalence of scabies was 9.7% by persons, 22.5% by households and 22.8% by families.[58]A study on scabies among primary school children in Bantwal Taluq, Kannada showed that 8.2% children had scabies and boys were more affected than girls.[43]

Permethrin (5%) cream is the treatment of choice in infants and children. It is applied from neck to toes in adults and young children and from head to toes in young infants. If necessary, it may be repeated after 2 weeks. Gamma benzene hexachloride (1%) is most widely used for its efficacy and affordability, but not recommended for infants and

children. It should not be applied to the face and second application after 1 week is necessary.[24]

To prevent re-infestation, close contacts, even if asymptomatic must be treated simultaneously. Patient education, daily bathing and no sharing of combs, clothes, beds, pillows, etc are useful preventive measures.[24]

4.8.2 Bacterial infections:

Pyoderma is emerging as a public health problem, either primary or secondary to scabies, in developing countries.

4.8.2.1 Pyoderma:

Pyoderma is a common purulent infection of the skin caused by Staphylococcal and Streptococcal organisms. Pyodermic infections include superficial bacterial infections such as impetigo, ecthyma, folliculitis, furunculosis, carbuncle, and erysipelas.[59] Predisposing factors include minor trauma, preexisting skin disease, poor hygiene and rarely, impaired host immunity.

Pyoderma affects more than 111 million children worldwide, making it one of the three most common skin disorders in children along with scabies and tinea. Many were also coinfected with scabies, tines or both.[60]

Mahé A et al conducted a community-based study in 1993 among eight outpatient health centers in Bamako, the capital of Mali to measure the proportion of dermatological care among them. Among the 14,058 consultations given, 1639 (11.7%) were found to have skin diseases. The main diagnoses were pyoderma constituting 42.2% of all the dermatologic diagnoses, eczema (15.5%), scabies (8.5%), and fungal infections (7.9%).[61]

4.8.2.2 Impetigo:

It is a superficial contagious bacterial infection of the skin most commonly caused by Staphylococcus species. It has bullous and non bullous forms. It commonly occurs on the face (especially around the nares), but any part of the body can be affected. The vesicles or pustules rupture leaving behind a characteristic honey-colored (yellow-brown) crust. Diagnosis is by clinical presentation of the lesion. [24]

The prevalence of pyoderma in children largely exceeds that of adults. Overcrowding, poor hygiene, hot and humid climate are classical predisposing factors for the development of impetigo.[24]

In North India, an epidemiological study of skin diseases among school children showed that the incidence of bacterial pyoderma (impetigo, folliculitis and infected bite reactions) was found to be 64.4% among all skin infections.[62]

In a study among households in two different neighborhoods in Karachi by Luby et al, the incidence of impetigo was 1.57 episodes per 100 person-weeks. The incidence was high among younger children and the incidence peaked in the month of July.[63]

In a clinico-bacteriological study among 100 cases of pyoderma by Karkar N et al, impetigo was the commonest primary pyoderma (48.61%) with 42% belonging to the 1-4 year age group. 58% belonged to lower socio-economic groups with poor standards of hygiene. 87% had history of over-crowding and 68% of the children reported only during the hot and humid months.[64]

Pyoderma is a skin disease for which the role of hygiene appears to be best established. Many studies have looked at the association of pyoderma and hygiene. In Mali, the presence of pyoderma in children was significantly correlated with poor personal

hygiene (OR = 1.68), and with the presence of rubbish in the courtyard of the family housing (OR=1.47).[65]

Topical treatment is usually adequate, either with bacitracin or mupirocin, applied twice daily for 7 to 10 days. Systemic therapy may be necessary for patients with extensive disease. Good hygiene practices prevent impetigo from spreading. All the members of the household should wash their hands thoroughly with soap and water regularly. Avoid contact with the infected person and his belongings. Sharing of towels, soaps and clothes should be avoided.[24]

4.8.2.3 Folliculitis, Furunculosis, and Carbunculosis:

Folliculitis is the superficial infection of the hair follicles characterized by erythematous, follicular-based papules and pustules. A furuncle is an acute, usually necrotic infection of a hair follicle with *S. aureus.* A carbuncle is a deep infection of a group of contiguous follicles with *S. aureus,* accompanied by intense inflammatory changes in the surrounding and underlying connective tissues. Carbuncles are more common in the presence of diabetes, malnutrition, cardiac failure, drug addiction or severe generalized dermatoses. Diagnosis is by clinical presentation of the lesion.[14]

In a case control study conducted in the dermatology outpatient clinic, overcrowding at sleep, poor personal hygiene, and obesity were independent predictors of recurrent boils.[66]

Topical treatment with 1% clindamycin or 2% erythromycin, applied two or three times a day to affected areas, coupled with an antibacterial wash or soap is adequate for patients with folliculitis. Warm compresses, incision and drainage and systemic

antimicrobial therapy are the modalities of treatment for furunculosis and carbunculosis. Control can be sought by improving the personal hygienic conditions.[24]

4.8.2.4 Ecthyma:

Ecthyma is a pyogenic infection of the skin characterized by the formation of adherent crusts, beneath which ulceration occurs. Usually ecthyma is a consequence of neglected impetigo. Poor hygiene and malnutrition are the predisposing factors. Diagnosis is by clinical presentation of the lesion.[14]

Treatment includes warm compresses and systemic antimicrobial therapy. Early diagnosis and treatment of impetigo will prevent the occurrence of ecthyma.

4.8.2.5 Intertrigo:

An intertrigo is an inflammation (rash) of the body folds (adjacent areas of skin). Most commonly affected areas are the armpits, beneath the breasts, genital area and abdomen. Moisture, heat, lack of air circulation and friction between skin folds causes intertrigo. It is more common in obese persons, diabetics, unhygienic living conditions, persons exposed to high heat and humidity.[14]

A systematic review on intertrigo showed that the prevalence of intertrigo in the large skin folds varies from 6% in hospital patients to 17% in nursing home clients and 20% in home care patients. There are no figures on the prevalence of intertrigo in the general population.[67] Prevention is by keeping the affected area dry and exposed to air, reducing weight and by avoiding wearing tight clothes.[14]

4.8.2.6 Leprosy (Hansen's disease):

Leprosy is a bacterial skin disease caused by Mycobacterium leprae. The global registered prevalence of leprosy at the beginning of 2011 stood at 192,246 cases.[68] In India,

the prevalence rate as on 1st April, 2014 was 0.68 per 10,000 population.[69] Tamil Nadu has already achieved the level of elimination (PR less than 1 case per 10,000 population).[69] Leprosy affects males more frequently than females. Socioeconomic factors play an important role in spread of leprosy all over the world. Highest risk groups are those living in endemic areas with poor conditions such as overcrowding, sharing beds, contaminated water, insufficient diet and immunosuppression.[24]

The clinical presentation of leprosy is polymorphous and can vary from hypopigmented macules that heal spontaneously to widespread damage to peripheral nerves, skin, eyes, and bone, with deformity and disability. Diagnosis is based on the clinical picture.[24]

Leprosy is treated with a multidrug therapy regimen with a daily dose of dapsone (100 mg/d) and clofazimine (50 mg/d), plus a monthly controlled dose of rifampicin (600 mg) and clofazimine (300mg) for 12 months.[24]

4.8.3 Fungal infections:

Though fungal infections are neither dangerous nor life threatening, superficial fungal infections are prevalent, irritating and more recurrent.

4.8.3.1 Dermatophytosis (Superficial fungal infections):

Dermatophytosis is a disease condition characterized by the infection of keratinized tissues such as the epidermis, hair and nails. This condition is caused by a group of closely related filamentous fungi commonly known as dermatophytes. *Epidermophyton*, *Microsporum* and *Trichophyton* are the genera of dermatophytes implicated in superficial mycoses.

Dermatophytes lack the ability to invade deeper tissues or organs of the host. The typical infections of dermatophytes are generally referred to as ringworm infections due to their ring like appearance. These infections are also known as 'tinea infections' and are named according to the location of the lesions on the body.[14]

Scalp fungal skin infections	-	Tinea capitis
Beard area fungal skin infection	-	Tinea barbae
Glabrous skin of the face	-	Tinea faciei
Hand fungal skin infection	-	Tinea manuum
Nail fungal skin infection	-	Tinea unguium
Fungal infection of the body	-	Tinea corporis
(Skin other than bearded areas, scalp, groin, hands or feet)		
Groin and buttocks fungal infection	-	Tinea cruris also called jock itch.
Foot fungal skin infections	-	Tinea pedis, also called athlete's foot

Superficial fungal infections (superficial mycoses) spread easily though direct contact with infected people, animals, clothing, brushes, and other objects. The fungi grows in moist parts of the body where the skin comes together such as between fingers, toes, under breasts, and in the genital area. Overweight people are more at risk of developing fungal skin infections.[24]

A study in an area south of Tehran area, Iran among clinically suspected dermatophytosis patients showed that the prevalence of dermatophytoses was 13.5%. Tinea corporis (31.4%) was the most common dermatophytosis, followed by tinea cruris (20.7%), tinea manuum (15.4%), tinea capitis (12.4%) tinea pedis (10.6%), tinea faciei (7.1%) and tinea unguium (2.4%).[70]

A study among clinically diagnosed patients of dermatophytoses attending the OPD in a tertiary centre in northwest India by Agarwal et al in 2012 showed that 46.33% belonged to lower middle class. Tinea corporis was the most common clinical pattern, in 37.3% cases followed by a mixed pattern in 14.7%, tinea cruris in 13.7%, tinea capitis in 13%, onychomycosis in 11%, tinea pedis in 3.7%, tinea faciei in 3%, tinea manuum in 2% and tinea barbae in 1.7% cases.[71]

A descriptive cross-sectional survey was carried out among 602 children aged 5-16 years in Oke-Oyi community, in Kwara state by Adefemi SA et al. The prevalence of clinically suspected dermatophytoses lesion was 29.9% with tinea capitis being the most common clinical type.[72]

Management of these dermatophytic infections is by application of antifungal creams and by improving the hygiene standards of the individuals.

4.8.3.1.1. Tinea capitis:

Tinea capitis occurs almost exclusively in children. It is caused by Microsporum canis. Infection occurs in all age groups with boys more commonly affected. Disease is common in overcrowded areas with low socioeconomic and hygiene status and by intimate personal contact through sharing of combs and bed linen. Patients present with pink, scaly patches on the scalp skin and there are areas of hair loss due to hair shaft breakage.[24]

A study to assess the prevalence of Tinea capitis among primary school children by Mandal et al in Kolkata, showed the prevalence of 10%.[73] A cross-sectional study among 454 children aged 4-17 years, attending a rural school and an urban school was done in Gabon. The diagnosis of tinea capitis was based on clinically manifestation. The prevalence

of tinea capitis ranged from 20.4% in the urban school with a higher socioeconomic status to 26.3% in the rural school with a lower socioeconomic status. [74]

A prospective, cross-sectional study of children up to 12 years coming to a pediatric hospital in New Delhi with suspected tinea capitis infection by Chander et al showed that majority of the children (74%) were in the lower middle class and 62% had history of sharing combs and hair accessories.[75]

4.8.3.1.2 Tinea faciei:

Tinea faciei is the infection of the glabrous skin of the face, usually the chin and the upper lip, with a dermatophytic fungus. It is the disease of women and children. It is more common in people with increased physical activity and in contact with domestic animals. The patient complains of itching, burning and exacerbation of infection after sun exposure. Lesions are flat patches of erythema.[14]

4.8.3.1.3 Tinea corporis:

Tinea corporis is ringworm infection of the body. Numerous dermatophytic fungi cause the infection but Trichophyton rubrum predominates. Higher prevalence is reported in tropical and subtropical areas and its predisposing factors include poor personal hygiene, poor nutrition and associated systemic diseases. They present as single to multiple, small to large, itchy, erythematous, circular lesions with central clearing.[24]

A study on 519 participants attending a hospital in Tiruchirapalli by Balakumar et al showed that clinically, Tinea corporis (35.4%) was the predominant clinical condition followed by tinea cruris (16.8%) and tinea capitis (16.7%). [76]

In a study to find the clinical pattern of dermatophytosis among clinically diagnosed and untreated cases in an OPD in Bijapur, tinea corporis with cruris was the most common

presentation. Dermatophytosis was common in the 21-30 year age group with males being the most affected.[77]

4.8.3.1.4 Tinea barbae

Tinea barbae is the ringworm infection of the beard and moustache areas of the face with invasion of coarse hairs. It is the disease of the males. Studies have proved the spread through close facial contact, person-to-person contact through infected barber's razors and spread from cattle. They present as red inflammatory papules or pustules around the hairs of the beard or moustache regions, usually with exudation or crusting.[24]

Early diagnosis and prompt treatment of the individual and the encouragement of high standards of hygiene helps to control the lesions.

4.8.3.1.5 Tinea manuum

Tinea manuum is the infection of the skin of the hand. Any species of dermatophyte may affect the skin of the hand. The most common presentation is the hyperkeratosis of the palms and fingers affecting the skin diffusely. Prompt treatment of other tinea infections and use of separate towels are sensible measures to control the infection.[14]

4.8.3.1.6 Tinea unguium

Tinea unguium is the invasion of the nail plates by species of dermatophytes. It is synonymous to the onychomycosis caused by dermatophytes. Onychomycosis is largely a disease of adults. Associated tinea pedis infection, nail destruction, old age and debilitating illnesses are contributing factors. Patient presents with thickened yellow nails and subungual debris.[14]

A retrospective analysis involving all cases of dermatophytoses observed in a hospital in Italy from 2005 to 2010 showed that the most frequent clinical form was tinea

unguium (39.2% of the total dermatophytoses), followed by tinea corporis (22.7%) and tinea pedis (20.4%)[78]

Avoidance of walking bare foot, keeping the parts cool and dry help to reduce the burden of infection in the community.

4.8.3.1.7 Tinea cruris (Jock itch):

Tinea cruris is the infection of the groins by a species of dermatophyte. The infection is more common in men, among those wearing tight undergarments and in warm humid climatic conditions where there is increased sweating and difficulty in maintaining hygiene. Sharing of towels, bed linens, clothing, bedpans and urinals are important modes of spread of infection. Itching is a predominant feature. They present as erythematous plaques with sharp margins extending from the groin down the thighs with or without scaling.[24]

Prompt treatment and avoidance of sharing towels and clothes help in control of infection.

4.8.3.1.8 Tinea pedis (Athlete's foot):

Tinea pedis is the infection of the feet or toes with a dermatophyte fungus. Most of the infections are by T. rubrum. The infection is more common in adults and males are affected more than females. Wearing occlusive footwear, staying in places where washing facilities are shared increase the chances of infection. Moist conditions and warm and humid climatic conditions favor the growth of the fungus. Itching is a common complaint in warm weather. They present with intertriginous dermatitis characterized by peeling, maceration and fissuring affecting the lateral toe clefts.[24]

A study by Maraki et al in Greece during 1992-96 showed that among all clinical forms of dermatophytes, tinea pedis was the most common (25.7%), followed by tinea corporis (24.7%), tinea unguium (19.9%) and tinea capitis (11.3%). [79]

Watanabe et al isolated dermatophytes from feet of healthy volunteers who never showed any signs of tinea pedis after attending a public bath. [80]

Avoidance of walking on the floors of communal changing rooms and by communal baths and showers will help to reduce the level of infection in the community.

4.8.3.2 Tinea versicolor:

A non-dermatophytic dimorphic fungus Malessezia furfur, causes tinea versicolor. It is a normal inhabitant of the skin. The expression of infection is promoted by heat, humidity, poor socioeconomic conditions and immunodeficiency. Typical lesions consist of oval scaly macules, papules, and patches concentrated more on the trunk, extremities and neck.[24]

Bechelli et al reported a prevalence of 13.2% of pityriasis versicolor, next only to pediculosis with a prevalence of 50% among school children in Brazil. Urbanization, socioeconomic situation, living conditions, promiscuity, climatic conditions and lack of hygiene were found to be the reasons for such high prevalence of these skin conditions.[50] A study in rural areas of Mali by Faye et al reported the presence of tinea versicolor in 39.4% of children with hypochromic patches.[81]

Effective management requires reduction of predisposing factors and once the lesions are dry, antifungal medication like solutions containing sulfur, salicylic acid or 2.5% selenium sulfide should be applied daily for one week and then intermittently thereafter.[24]

4.8.4 Viral infections:

4.8.4.1 Warts (Verruca vulgaris):

Warts are cutaneous neoplasms that are caused by human papilloma virus (HPV). Warts occasionally cause pain, but they can be cosmetically bothersome.

The common wart (Verruca vulgaris) is associated with HPV – 2 and HPV – 4 infections. It appears flesh coloured or grayish with a hyperkeratotic surface. The flat wart (Verruca plana) caused by HPV – 3, are tan to flesh coloured, slightly raised, smooth surfaced papules.

HPV is transmitted by direct contact, use of contaminated objects, use of communal bathing, use of common changing facility and by autoinoculation from hand to foot and vice versa. Trauma and nail biting are also predisposing factors.[14]

Cross-sectional studies done in schools have shown the prevalence to vary from 2 to 20%. Children and young adults are most affected. They are benign tumors that often resolve spontaneously. Freezing the lesion, chemical cautery, carbon dioxide laser can also be employed. Avoiding contact with the infected person can also help to control the spread of warts.[24]

A clinico-epidemiological study on cases of viral warts in Pondicherry by Chandrashekar at al reported that viral warts were most common in 10-20 years age group with hands being most commonly involved. The most common type of wart seen in children and adults was the common wart.[82]

4.8.4.2 Molluscum contagiosum:

Molluscum contagiosum is a benign infectious disease caused by Molluscum contagiosum virus, an obligate human pathogen. It has a worldwide distribution with

children and adolescents affected more and males are more commonly affected. Mode of transmission is by direct skin-to-skin contact or by fomites. They are pearly umbilicated skin lesions with a characteristic dimple at the centre. Diagnosis is made by clinical presentation of the lesion.[24]

A study by Dogra et al in 2003 reported a point prevalence of 0.42% in Chandigarh.[62] A systematic review on its epidemiology by Olsen et al showed that children of 0-14 years age group were most affected, with point prevalence between 5.1% and 11.5%. There was an association with swimming and transmission between family members. The duration of the lesions ranged from 2 weeks to 24 months.[83]

Lesions are self-limiting and regress spontaneously. Preventing the transmission of the disease can help to control the disease.

4.9 Risk Factors for preventable skin diseases:

According to WHO, the three major factors that explain the high prevalence and incidence of transmissible skin diseases in developing areas are a low level of hygiene, including difficulties in access to water, climatic factors and overcrowding.[3]

In the epidemiological triad, the environment plays a vital role in the pathogenesis or exacerbation of most of the preventable skin diseases. They may include:

- Hot humid climates that predispose to fungal skin diseases.
- Contact with others, sharing the belongings with others may be an important factor.
- The standard of living and housing may be important.
- The type of pets in the house such as cats, dogs, birds etc may have an effect.[5]

Millions of the world's poorest people suffer from preventable skin diseases each year. Women and children are the main victims.

Studies done by Ranyal RK et al,[40] Kuruvilla M et al[43] have shown the highest prevalence of transmissible skin diseases among children and adolescents belonging to 0-19 years age group.

A study on households in Pakistan showed that 27% of the households had skin infections and they resided in crowded houses with poor water and sanitation (WATSAN) facilities.[84]

The WASH household survey at Gaza by UNICEF and PHG showed that the primary source of domestic water was water from the Municipal network, only 7% households complained about open stagnant sewage. 44 % of people showered every day. Hygienic practices varied, with 45 % of all respondents washing their hands before cooking and 65 % washing their hands before eating.[85]

The National Sample Survey (NSS) conducted by the Government of India in 2012 showed that 62.3% of households in the rural areas and 16.7% of households in the urban areas did not have bathroom facility.[86]

Bradley (1977) classified scabies, shigellosis, trachoma, and skin and eye infections as water washed diseases. Water washed diseases are diseases whose incidence, prevalence or severity can be reduced by using safe (clean) water to improve personal and domestic hygiene. Cairncross and Feachem in 1993 suggested to restrict the water- washed diseases to only as those skin and eye infections that solely relate to the quantity of water used for hygiene. The term water washed diseases is no longer used. McJunkin suggested the alternative of ‘water-hygiene diseases’.[87]

WHO and UNICEF reported that at the end of 2011, 761 million used public or shared sanitation facilities and another 693 million used facilities that did not meet minimum standards of hygiene.[88]

4.9.1 Hygiene:

World Health Organisation refers to hygiene as the conditions and practices that help to prevent the spread of diseases and maintain health.

Lack of personal hygiene is associated with an increase in the incidence of skin diseases such as head lice, and scabies, and unhygienic living conditions seems to be an important factor responsible for a higher incidence of skin infections in developing countries.

In a study in squatter settlements in Pakistan by Luby et al, when the households were encouraged to wash hands with soap, the incidence of impetigo in children was lowered by 34%.[63]

Poor health resulted from the low awareness of the health benefits of personal hygiene. This was supported by a knowledge, attitudes, and practices study on hygiene among 669 rural primary school children in Ethiopia in 2005 showed that one-third of the students did not take bath for at least 14 days. 9% (N=41) did not brush their teeth, 12% (N=79) did not wash or change their clothes daily and 21% (N=135) did not wash their hair for 2 weeks. Taking bath and washing hair were the least common hygiene practices followed by them. 75% of students felt that washing hands after defecation was important, but only 15% (N=96) washed their hands after defecation. It was also found that those with adequate knowledge on proper hygiene were wearing clean clothes.[89]

Adequate personal hygiene is essential for good health. A descriptive cross sectional study was conducted to find out the diet and hygienic habits of adolescents in Navalcarnero, a rural town in Spain. The findings revealed that most of them have a shower and wash their hair every two or three days, brush their teeth and changed their clothes daily.[90]

An observational study on knowledge of personal hygiene among primary school children in Chetla slum area of Kolkata showed that female students were more knowledgeable than male students regarding maintenance of personal hygiene. A wide gap was observed between practice and knowledge of personal hygiene them. There was a strong statistically significant association between practices of personal hygiene among the children and literacy status of their mother.[91]

4.9.2 Overcrowding:

A study done among prisoners in Northern Tanzania by Leppard B et al showed that there was an outbreak of scabies among the prisoners. The most important reason for the outbreak was due to overcrowding.[92]

Overcrowding is an important factor in the spread of scabies. Studies from Mali, India, Brazil and northern Australia all show an association with overcrowding, especially sleeping quarters.[50,65] Closed communities and institutional environments experience high endemic rates and epidemic outbreaks in tropical and developing countries. For example, 86% of children in a Sierra Leone displacement camp,[93] 31% of children in a Malaysian welfare home[94] and 87.3% of children in a Thai orphanage had scabies.[95]

A study in rural area by Gibbs et al showed 27% of patients had a treatable skin disease, and once again infections were the most common disease. Overcrowding was a major risk factor in that survey.[26]

4.9.3 Climate:

Certain diseases have seasonal peaks, for example superficial fungal infections worsen during seasons of high environmental temperature, especially with high humidity climates.

In rural Haryana, the most common morbidity was pyoderma (23.65%) and the maximum incidence of pyoderma in health centres was during the summer, where the number of cases nearly tripled compared to winter.[96]

4.9.4 Other factors:

4.9.4.1 Socioeconomic factors:

In regions with a poorer socioeconomic environment, morbidity rates, especially regarding infectious diseases, have been found to be higher. Socioeconomic factors also affect skin disorders, particularly transmissible skin diseases, which are observed frequently in people living in poor conditions.

A cross sectional community based study conducted in rural Assiut in Egypt reported that 87% population had one or more skin diseases. In them, parasitic infestations were 27.4% with pediculosis capitis in 19.4%. These diseases are a major problem among the younger age group and those belonging to low socioeconomic status.[97]

A study by Willems S et al among school children showed a prevalence of head lice of 8.9% and there was clustering of children with head lice. A significant association was found with low socioeconomic level, number of children in the family and hair length.[98]

Most forms of infectious disease, including those of the skin, are now more common in the third world than in Western countries, and it would seem, that the poorer standards of living in these countries are likely to be the causes of this.

4.9.4.2 Medical factors:

A study among diabetics in Kuwait showed a high prevalence of cutaneous skin manifestations with infections (68%). Fungal infection (39.4%) was the major cutaneous manifestation followed by Staphylococcal infections (25.4%).[99]

4.10 Initiatives in India

The National Rural Health Mission launched a new initiative, Rashtriya Bal Swasthya Karyakram, a Child Health Screening and Early Intervention Services Programme to provide comprehensive care to all the children in the community. The objective of this initiative is to improve the overall quality of life of children through early detection of birth Defects, Diseases, Deficiencies, Development Delays and Disability.

Child Health Screening and Early Intervention Services under NRHM envisaged to cover 30 identified health conditions for early detection and free treatment and management. Skin conditions (scabies and fungal infection) were identified in children 6 weeks to 18 years. The children are examined by the Block Health District Early Intervention Centre (DEIC) Team biannually and managed at CHC/DH District Early Intervention Centres. These centres are to be set up as first referral point for further investigation, treatment and management of the identified children.[100]

Materials and Methods

5. MATERIALS AND METHODS

5.1 Study Design:

This study was conducted at the community level as a community based cross sectional study to estimate the prevalence of preventable skin diseases and their risk factors among households in selected slums of Chennai, Tamil Nadu.

5.2 Study Area:

The community-based study was conducted in selected slums of Chennai, Tamil Nadu, India.

5.3 Study period:

The study was carried out from December 2013 to August 2014. The period of field study was from February 2014 to May 2014.

5.4 Study population:

The study population comprised of households in the selected slums of Chennai. The study participants included all the members in the selected household.

The reason for choosing this population was that the living conditions in slums are usually overcrowded and unhygienic accelerating the spread of diseases and skin diseases are often transmissible. Thus when one person in the household is affected, the entire household gets affected easily within a short period of time. By just giving proper health education on improving their personal hygiene and living conditions, these diseases can be greatly avoided and the prevalence of these skin diseases among households can be reduced drastically.

5.4.1 Inclusion Criteria:

- Households living in selected slums of Chennai who were willing to participate were included as part of the study.
- Those who understand and speak Tamil

5.4.2 Exclusion Criteria:

i) Those households who participated in the pilot study.

ii) Houses that were locked during the three visits.

iii) Household members who were not available during the three visits.

5.5 SAMPLE SIZE

Calculated Sample size: 506 individuals

Sample size covered: 520 individuals

5.5.1 SAMPLE SIZE CALCULATION:

Formula for cluster sampling method:

$$Z^{2}_{1-\alpha/2}\, pq/d^{2} * \text{design effect}$$

Where,

$Z^{2}_{1-\alpha/2}$ =1.96 at 95% confidence interval

p=Prevalence

q=1-p

d=Allowable error

Design effect= 2

The prevalence for the present study was calculated from the pilot study that was conducted among 50 households in a slum in Chennai. Total of 248 individuals in the 50 randomly selected households were interviewed and examined for preventable skin

diseases. All the members in the household were selected. Preventable skin diseases were present in 106 individuals (42.7%). This prevalence {p} of 42.7% was taken for the main study. Study population of the pilot study was excluded from the main study.

p = 42.7%

q =100 - 42.7 = 57.3%

d={allowable error of 15% of prevalence was taken for this study

i.e. 15% of 42.7 = 6.405}.

Substituting all the above values in the formula,

$N = Z^2_{1-\alpha/2}\, pq/d^2$ * design effect

$N = (1.96)^2 * 42.7 * 57.3 / (6.405)^2 * 2$

=230 * 2

= 460 individuals.

Allowing a 10% (46) for permissible errors like non - response rate,

The sample size comes around **460 + 46 = 506 individuals.**

5.6 Sampling method:

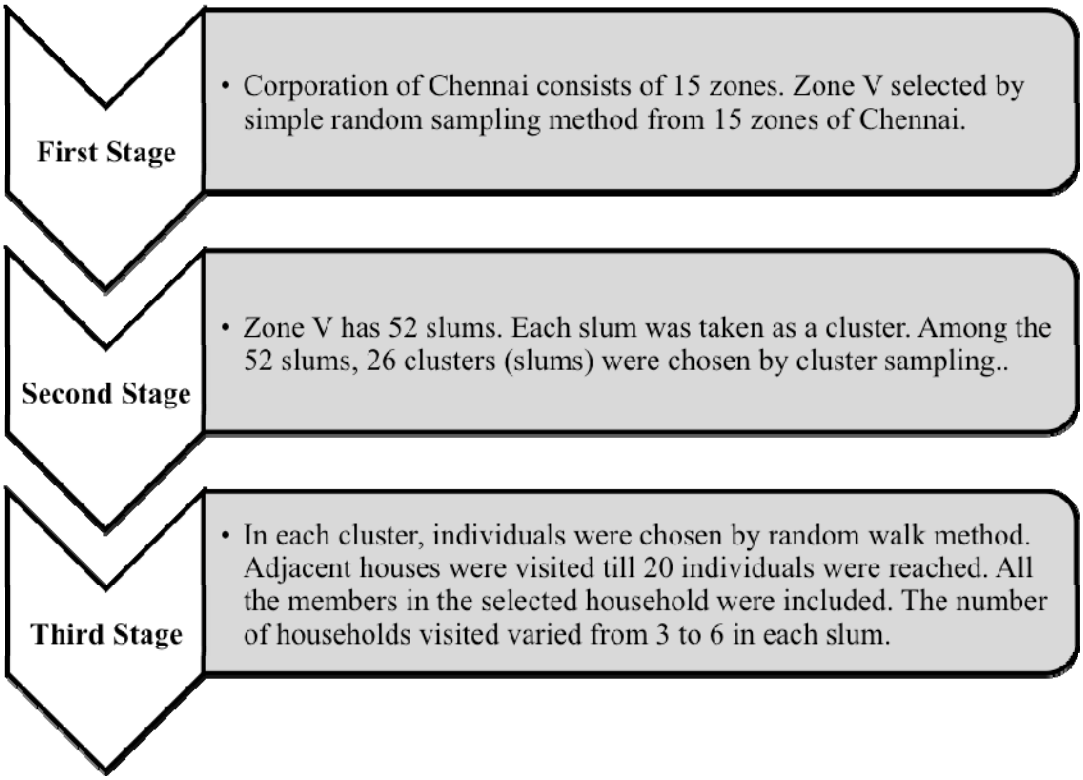
The study was carried out by a multistage sampling method. The first stage employed a simple random sampling technique, followed by a cluster sampling.

5.6.1 Multistage sampling method:

a. The Corporation of Chennai divides Chennai into 15 Zones. Zone 5 was chosen randomly by lots method.
b. Zone 5 consists of 52 slums (Annexure 5). The slum wise population list was obtained from Corporation of Chennai. The total population of 52 slums is around

1,35,353. Each slum was taken as a cluster. 26 clusters were chosen by cluster sampling method.

c. From each cluster, 20 individuals were chosen by random walk method. A starting point was selected randomly and using right hand rule, adjacent houses were recruited continuously till 20 individuals were reached. In each household, all the members were selected for the study. The number of households visited in each slum varied from 3 to 6, depending on the household size.



5.6.2 Method of choosing clusters:

1) With the cluster size of 20, number of clusters needed

= Sample size /cluster size

= 506/20

= 25.3 clusters

= 26 clusters

Therefore, with equal cluster size of 20, sample size to be covered for 26 clusters was calculated as 26x20 = 520 individuals.

2) Chennai zone 5 consists of 52 slums. The population of 52 slums is around 1,35,353.
3) Cumulative population of all the slums in zone 5 was calculated.
4) Cluster interval = cumulative population /total number of required clusters

   = 1,35,353/26

   = 5,205.88
5) One number randomly chosen from 1 to 5,206 was taken as 1st cluster (slum) and subsequent clusters were selected by adding cluster interval to the first cluster and so on till the required no of clusters are obtained. By this method, 26 clusters were selected. (Annexure 5)

5.7 MEASURING TOOLS:

5.7.1 Study Instruments:

1. A validated semi structured questionnaire,
2. Head to foot examination of skin, hair and nails.

5.7.1.1 Questionnaire:

The Questionnaire for the present study was developed based on UNICEF- WASH (Water Sanitation And Hygiene) Questionnaire 2009 by the WHO/UNICEF Joint Monitoring Programme for Water Supply and Sanitation.[85] The Questionnaire was modified according to the local culture and validated with the help of expert & pilot study (Annexure 2). It was translated into Tamil and again back translated to English to ensure that the meaning of the message conveyed did not vary.

Questionnaire for the present study was divided into 5 parts namely

a. Socio demographic particulars of the individuals and their family
b. History regarding the hygiene practices
c. Medical history
d. History related to skin diseases
e. Examination - General appearance score to measure the personal hygiene, examination of skin for colour and for diseases of the skin and its appendages.

The questionnaire was pretested among 50 households in slums during the pilot study and based on the observations, necessary modifications were made for the main study. The results from the pilot study were not included in the final analysis.

5.7.1.2. Examination:

Following the interview of the participant with the questionnaire, head to foot examination of skin and its appendages was done for all the participants of the study.

5.7.1.2.1 General appearance score:

The general appearance score to measure the personal hygiene of each participant was prepared based on A Manual on Hygiene Promotion by UNICEF,[101]Sanitation and hygiene promotion: programming guidance by Water Supply and Sanitation Collaborative Council and World Health Organization[102] and from various literature reviews.[89,103]

The score index was created from 13 items, which included dress, skin, hair/scalp, eyes, ears, nose, face, teeth and nails. Each item was scored as 0 or 1, with 1 representing a positive behaviour. The score index was calculated as the simple sum of the items. A person with a score index of six and less, was considered to have poor personal hygiene, a score

index of seven to ten with fair personal hygiene and a score index of more than ten was considered to have good personal hygiene.

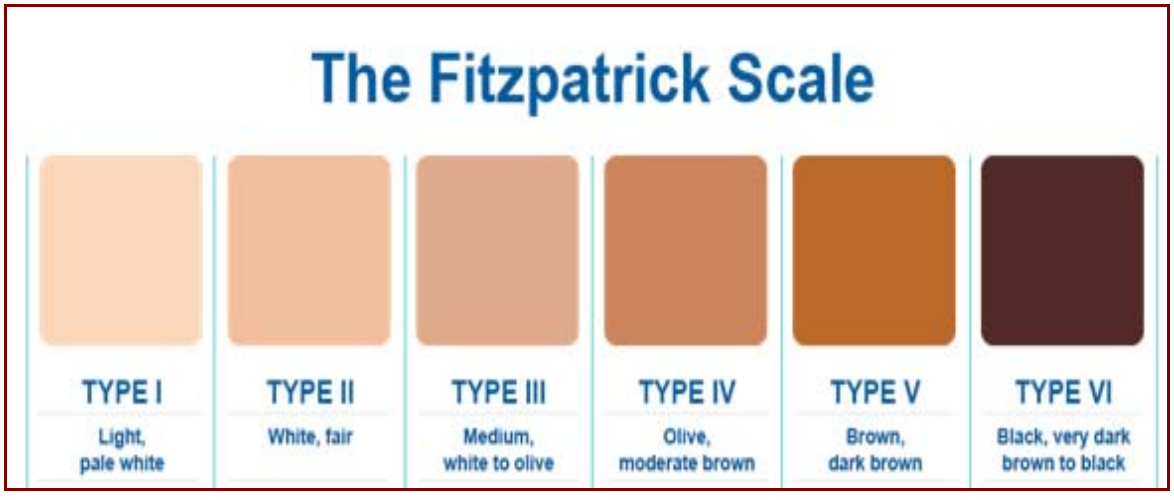
The score index was modified according to the local culture and validated with the help of expert & pilot study (Annexure 2).

5.7.1.2.2 Colour of the skin:

The colour of the skin of the participant was assessed based on the genetic disposition component of Fitzpatrick skin type classification scale.

Fitzpatrick scale is widely accepted to assess a person's skin type. It is a numerical classification scheme for determining the color of the skin. The current Fitzpatrick skin type classification denotes six different skin types, skin color, and reaction of the skin to sun exposure. The genetic disposition component of the scale ranges from pale white (skin type I) to very dark brown to black (skin type VI).

Figure 3: Fitzpatrick skin type classification[59]



5.7.1.2.3 Examination of the skin and its appendages:

The diagnosis of the skin lesions were based essentially on clinical observations, as no laboratory investigation were undertaken. The skin diseases were diagnosed based on the definitions for individual diseases that were framed with the help of dermatological experts and standard dermatology textbooks.

5.8 Data collection and methods:

a. Data collection was done in the study area after obtaining permission from The Director, Institute of Community Medicine and the Dean, Madras Medical College, Commissioner of Chennai Corporation and approval from the Institute Ethics Committee (Annexures 9,10).

b. Prior to the collection of data, the investigator underwent one month training in Department of Dermatology, Rajiv Gandhi Government General Hospital under the guidance of a Dermatologist on the diagnosis, treatment and prevention of preventable skin diseases.

c. Prior to the main study, a pilot study was done among 50 randomly selected households in a slum in Chennai to find the prevalence of preventable skin diseases and to pretest the questionnaire. Total of 248 individuals in the 50 randomly selected households were interviewed and head to foot examination was done for preventable skin diseases. Necessary modifications were made in the questionnaire. The prevalence of preventable skin diseases of 42.7% among the individuals was taken to calculate the sample size for the main study.

d. For the main study, data was collected by house-to-house visit in the study area. The members who were not available during the three visits were excluded from the study.

Where the house was locked during the three visits, the next house was taken for the study.

e. The individuals were contacted by going to their houses. Each participant was given a brief introduction about the study and informed consent was obtained from all participants and if the participant was a child, informed consent from the parents was obtained. The interview and examinations were done ensuring privacy. (Annexure 1)

f. Relevant information was obtained from the respondent using the semi-structured questionnaire in the local language at their homes. Questionnaire was read out to the study participants in the same order as listed in the questionnaire and sufficient time was given to the subjects to respond. If the study subject did not understand the question, it was repeated in the same manner without probing for the answer.

g. Each study subject was then subjected to head to foot examination to look for their general appearance, skin colour and any lesions of the skin and its appendages. Each member of the household was examined individually ensuring privacy in their own houses.

h. Each participant was examined from head to foot in bright day light for their general appearance and lesions of the skin, hair and nails by asking them to remove their clothes. The general appearance of each participant was assessed by keen observation and examination of the condition of clothing, skin, hair, nails, eye, ears, nose and teeth. Lesions of the skin and its appendages were viewed using hand lens. Doubtful cases were taken to the dermatologist for their confirmation of the skin disease.

To avoid medico-legal issues, female colleague accompanied while examining female subjects and male colleague accompanied while examining male subjects.

5.9 Services rendered:

Participants who were diagnosed to have skin diseases were noted separately and medicines were given to them as per the dermatologist opinion. They were then referred and also motivated to utilize the services provided at the Dermatology OPD, Rajiv Gandhi Government General Hospital, Chennai-3 for investigations, further follow up and treatment. Health education regarding personal hygiene and prevention of skin diseases was given to all the members of the household during the visit.

5.10 Statistical Analysis:

The collected data was entered for analysis in Microsoft Excel. This data was exported to Statistical Package for Social Sciences software version 16 for analysis. Descriptive statistics (mean, standard deviations and range) were employed to describe continuous variables, while frequency distributions were obtained for dichotomous variables. Associations between qualitative variables were done using Chi square tests, Fisher's exact test; correlation and regression. Odds ratio and their confidence intervals was calculated to assess the estimate of the risk. A p value of less than 0.05 has been considered to be significant.

5.11 VARIABLES OF INTEREST AND OPERATIONAL DEFINITIONS:

1. Preventable skin diseases:

Skin disease refer to disorders of exclusively (or predominantly) the superficial layers of the skin. Preventable skin diseases are those infectious skin diseases that can be avoided by improving the housing standards and hygiene practices, reducing overcrowding and improving the socioeconomic status of the community. These diseases are of greatest importance in terms of public health. The diseases are:

- Parasitic and helminthic infection (head lice, scabies)
- Fungal infection (dermatophytosis, pityriasis versicolor)
- Bacterial infection (impetigo, folliculitis, carbuncle, furunculosis, intertrigo, ecthyma, leprosy)
- Viral Infection (warts, molluscum contagiosum) [3,24]

The operational definitions for the skin diseases were framed with the help of dermatological experts and standard dermatology textbooks.

a. **Pediculosis capitis:** History of scalp pruritis and removal of head louse in the past one week or by demonstration of adult lice or nits (nits appear as gray or white specks attached to the hair) on direct examination of the involved area. The commonest areas to find the nits are behind the ears and near the nape of the neck.

b. **Scabies:** Cardinal features in the clinical diagnosis of scabies are:
    - Intense pruritis, which worsens at night
    - Presence of a burrow, especially on the hands and penis
    - Characterestic distribution of lesions on the webs of the fingers, flexor aspect of wrist, elbow, anterior axillary fold, umbilicus, peri umbilical area, genitalia, upper thighs, knees and ankles.
    - Presence or history of similar lesions in other members of the household or other contacts.

c. **Impetigo:**

Bullous impetigo: Diagnosed by the presence of relatively thick walled superficial bulla, with very little erythema surrounding it. The ruptured one has a very thin yellow crust. Commonly involved site is the face, but any part including the mucous membrane can be affected.

Non-bullous impetigo: Diagnosed by the presence of erythematous macule over which a thin roofed vesiculo pustule appears. The vesicle fluid is clear initially, but later becomes turbid. Once the roof ruptures, the seropurulent discharge dries up and forms a loosely adherent, honey or straw coloured granular crust.

d. **Furunculosis**: Diagnosed by the presence of small, follicular, inflammatory nodule, which becomes pustular and then necrotic and heals leaving behind a violaceous macule and, ultimately, a permanent scar. Usually affects the skin of the face, neck, buttocks, and axillae.

e. **Carbuncle:** A carbuncle is made up of several skin boils. It may be small to large, red with white to yellow centre. The infected mass is filled with fluid, pus and dead tissue.

f. **Folliculitis:** Diagnosed by the presence of lesions that generally consist of painful yellow pustules surrounded by erythema. A central hair may be present in the pustules.

g. **Ecthyma:** Ecthyma lesion usually begins as a vesicle or pustule on an inflamed area of skin. A hard crust soon covers this. When the crust is removed, there is an indurated ulcer that may be red, swollen and oozing with pus. The areas most affected are the buttocks, thighs, legs, ankle and feet.

h. **Intertrigo:** Often found in skin fold areas of the underarms, beneath the breasts and in the groin creases. Affected skin is itchy, reddened and sore.

i. **Dermatophytosis**

- **Tinea corporis**: Diagnosed by the presence of single or multiple annular, well-defined, itchy, erythematous, scaly patches with central clearing. The active border consists of papulo vesicular lesions and advancing scales. The trunk and legs are primarily involved.
- **Tinea faciei**: Diagnosed by the presence of annular papules or flat patches of erythema in the face.
- **Tinea cruris (Jock itch):** Diagnosed by the presence of erythematous itchy plaques with an advancing well-defined scaling border, with a tendency toward central clearing in the inner thigh and buttock region.
- **Tinea pedis (Athlete's foot)**: Diagnosed by the presence of itchy maceration, scaling and fissuring or scaly erythematous plaque lesions on the soles. Borders are distinct. Mostly seen in the toe webs or in the soles.
- **Tinea capitis**: Diagnosed by the presence of oval or round, pink, scaling patches on the scalp skin with areas of hair loss due to breakage of hair shafts.
- **Tinea unguium:** Diagnosed by the presence of nails that look white and opaque, thickened, and brittle with marked subungual hyperkeratosis.
- **Tinea barbae**: Diagnosed by the presence of red inflammatory papules or pustules, usually with exudation or crusting. Many hairs in the affected areas are loose and can be easily removed with the forceps without causing pain. Hairs of the beard or moustache regions are commonly involved.

j. **Tinea versicolor (Pityriasis versicolor):** Diagnosed by the presence of hypopigmented or hyperpigmented well defined multiple, mildly itchy macules, covered with fine brawny (powdery) scales. Upper trunk, upper arms, neck and abdomen are most commonly involved with intact sensation.

k. **Warts (Verruca vulgaris):** Diagnosed by the presence of circumscribed firm keratotic papules, varying in size with horny surfaces. They may be single or multiple, discrete or confluent, commonly present over the back of hands and fingers, but can appear on any part of the body.

l. **Molluscum contagiosum**: Diagnosed by the presence of lesions that are shiny, skin coloured to pearly white, waxy, hemi spherical, umbilicated papules ranging from 1 to 10 mm in diameter. They may be single or multiple, usually present over the trunk, limbs and face.

2. **Description of terms in the operational definition:**

- **Macule:** A small, flat, non-palpable lesion smaller than 10 mm in diameter. Macule indicates a lesion with color or subtle texture change only, without elevation above the skin surface.
- **Patch:** A flat, non-palpable lesion of 10 mm in diameter or larger. (A large macule).
- **Papule:** A small, superficial, circumscribed, palpable lesion elevated above the skin surface, less than 10 mm in diameter.
- **Plaque:** A palpable lesion elevated above the skin surface, 10 mm or greater in diameter.

- **Nodule:** A firm (indurated) lesion that is thicker or deeper than the average papule or plaque.
- **Vesicle:** An elevated lesion that contains clear fluid, a small blister less than 10 mm in diameter
- **Pustule:** A superficial elevated lesion that contains yellow fluid (pus) within or beneath the epidermis, generally protein-rich and contains neutrophils.
- **Hyperkeratosis:** Thickening of the outermost layer of the epidermis.
- **Erythema:** Erythema represents a change in the color of the skin that is due to the dilation of blood vessels.[104]

3. **Socio Demographic Variables:**

   Age: Completed age in years at the time of interview was considered for the study.

   Sex: Sex was recorded as male or female

   Religion: Includes (1) Hindu, (2) Muslim, (3) Christian (4) others.

4. **Household:** A group of persons normally living together and taking food from a common kitchen constituted a household.[86]

5. **Type of house:**

   i. **Pucca structure**: A pucca structure is one whose walls and roofs are made of pucca materials such as cement, concrete, oven burnt bricks, hollow cement / ash bricks, stone, stone blocks, jack boards (cement plastered reeds), iron, zinc or other metal sheets, timber, tiles, slate, corrugated iron, asbestos cement sheet, veneer, plywood, artificial wood of synthetic material and poly vinyl chloride (PVC) material.

ii. **Katcha structure**: A structure, which has walls and roof made of non-pucca materials, is regarded as a katcha structure. Non-pucca materials include unburnt bricks, bamboo, mud, grass, leaves, reeds, thatch, etc.

iii. **Semi-pucca structure:** A structure, which cannot be classified as a pucca, or a katcha structure as per definition is a semi-pucca structure. Such a structure will have either the walls or the roof but not both, made of pucca materials.[86]

6. **Room:** A constructed area with walls or partitions on all side with at least one door way and a roof overhead. [86]

7. **Adequate water supply:** To find out whether households get sufficient water throughout the year for all household activities (i.e.) Amount of water that is used by households not only for drinking purposes but also for other household activities. Examples of such household activities are use of water in cooking, bathing, latrine, washing utensils, washing clothes, cleaning household goods, cleaning of floors, etc. [86]

8. **Main source of water:** The principal source of water for uses of the household other than drinking was understood as the source, which was most commonly used (in terms of frequency) by the household during the last 365 days for purposes other than drinking. [86]

9. **Skilled worker**: As per Minimum wages act, skilled employee is one who is capable of working independently, efficiently and accurately. An individual who is knowledgeable about a specific skill or trade.

10. **Semi-skilled worker**: As per Minimum wages act, Semi-skilled employee is one who has sufficient knowledge of the particular trade or above to do respective work and simple job with the help of simple tools and machine.

11. **Un-skilled worker:** As per Minimum wages act, Un-skilled employee is one who possesses no special training and whose work involves the performance of the simple manual tasks, which may be quickly learned and has no identifiable skill.

12. **Over crowding criteria**: The degree of over crowding expressed as the number of persons per room. The accepted standards are 1 room - 2 persons, 2 rooms - 3 persons, 3 rooms - 5 persons, 4 rooms - 7 persons, 5 rooms -10 persons. If more than this standard is called as overcrowding.[86]

13. **Bathing:** Defined as washing of all body parts including genital area with clean water.[105]

14. **Place of Shaving:** The place where the participant shaved his hair or beard during the last 6 months from the date of the study.

15. **Wearing washed clothes daily:** Defined as change of clothes with clean ones daily. [105]

16. **Socio- Economic Status:** The socio-economic status was classified based on Modified B.G. Prasad Classification, 2014 (Annexure 3)
17. **Head of household:** The person in formal charge of the management of the household is the head of the household.[105]
18. **Adult:** A person (male or female) who has completed 15 years of his or her age on the date of survey is an adult. [105]
19. **Child**: A person (male or female) below the age of 15 years on the date of survey is a child.[105]
20. **Literate:** A Person who can read and write a simple message in any language with comprehension.[105]

Results and Analysis

6. RESULTS AND ANALYSIS

This cross sectional study included 520 participants residing in 107 households, with 20 individuals each, from 26 slums in Zone 5 of Corporation of Chennai. The study estimated the prevalence of preventable skin diseases among households and among the participants and also the risk factors for the disease in the same population.

The data collected was analysed as follows:

- Simple frequency of socio demographic details of the study population, preventable skin diseases among households and individuals, prevalence of skin lesions, classification of preventable skin diseases based on etiological agent, socio demographic distribution of preventable skin diseases, overcrowding, distribution of risk factors among households, distribution of risk factors among individuals residing in households, general appearance score and colour of the skin in the study population.

- Then association of preventable skin diseases with socio demographic variables, association of risk factors and socio demographic variables, association of preventable skin diseases with risk factors like type of house, place of bath, frequency of bathing, application of oil to hair and body, hand hygiene practices, general appearance score and sharing of things among the participants was found.

- Then association between individual skin diseases and their risk factors was found. Association of hair related risk factors and pediculosis, association of facial hygiene related risk factors and tinea barbae, association of foot hygiene related risk factors and tinea pedis, association of washing hands with impetigo and scabies, cross

tabulation between hygiene score and skin diseases, cross tabulation between colour of the skin and skin diseases.

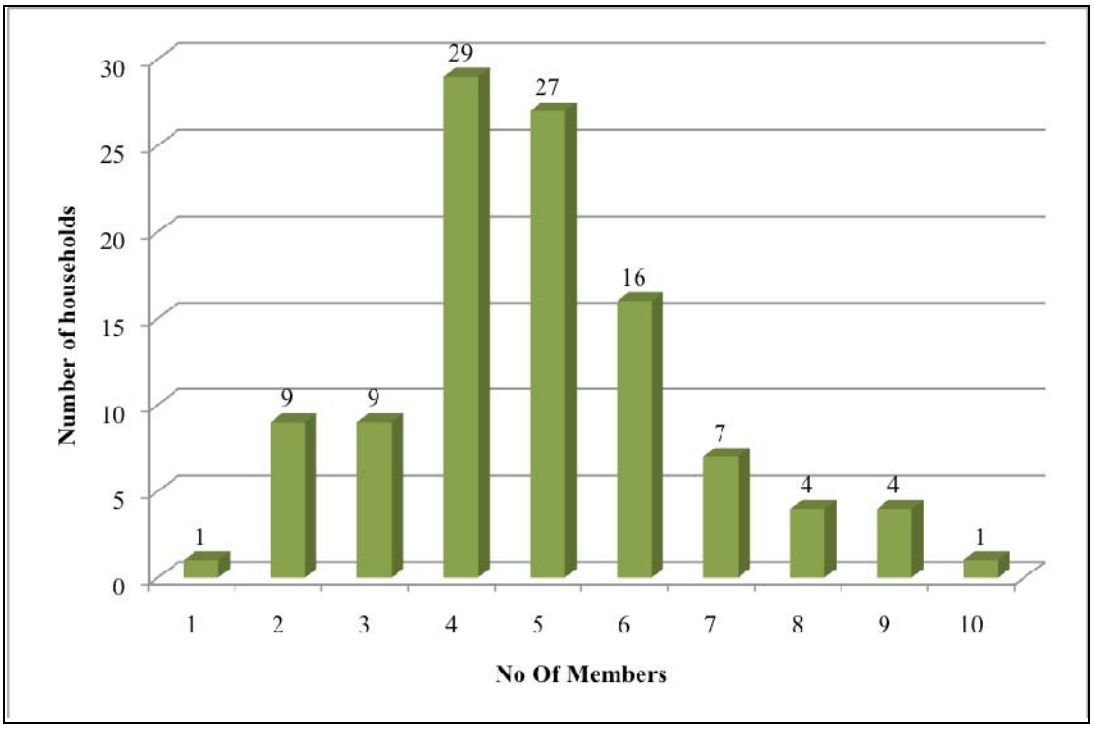
- Multivariate logistic regression.

6.1 Socio demographic details of the study population

6.1.1 Members in each household

The total number of households visited was 107. The number of members in each household ranged from 1 to 10 with a total of 520 study participants and the average household size was 4.86 persons.

Figure 4: Number of members in each household (N=107)



6.1.2 Age and sex wise distribution of the study participants

Table 3: Sex distribution of the study participants

Sex	Number of participants (N=520)	Percentage
Male	235	45.2
Female	285	54.8
Total	**520**	**100**

Table 3 shows that among the study participants, 54.8% (285) were females and 45.2% (235) were males.

Table 4: Age wise distribution of the study participants

Age group	Number of participants (N=520)	Percentage
Less than 10 years	71	13.7
10 to 19 years	80	15.4
20 to 29 years	117	22.5
30 to 39 years	78	15
40 to 49 years	86	16.5
50 to 59 years	52	10
More than 60 years	36	6.9
Total	**520**	**100**

Among the study participants, 71 (13.7%) were less than 10 years, 80 (15.4%) were between 10 to 19 years, 117 (22.5%) were between 20 to 29 years, 78 (15%) were between 30 to 39 years, 86 (16.5%) were between 40 to 49 years, 52 (10%) were between 50 to 59 years and 36 (6.9%) participants were 60 years and above.

Figure 5: Age and sex distribution of the study participants (N=520)

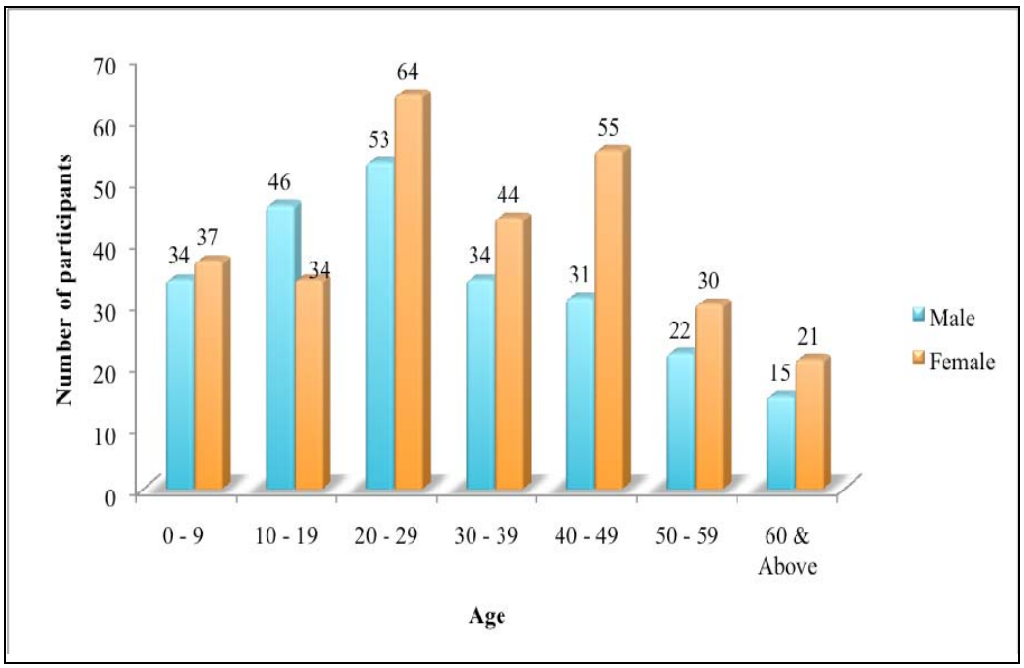


Figure 5 shows the age and sex distribution of the study participants. Females were predominating in all age groups except between 10-19 years. The youngest among the study participants was 7 months old, while the oldest was 92 years old.

6.1.3 Distribution of religion among the study participants

Table 5: Distribution of religion among the study participants

Religion	Number of participants (N=520)	Percentage
Hindu	397	76.3
Muslim	5	1.0
Christian	118	22.7
Total	**520**	**100.0**

Among the study participants, 76.3% were Hindus, 22.7 % were Christians and only 1% belonged to Muslim religion. (Table 5)

6.1.4 Educational Status of the study participants

Figure 6: Education Status of the study participants (N=520)

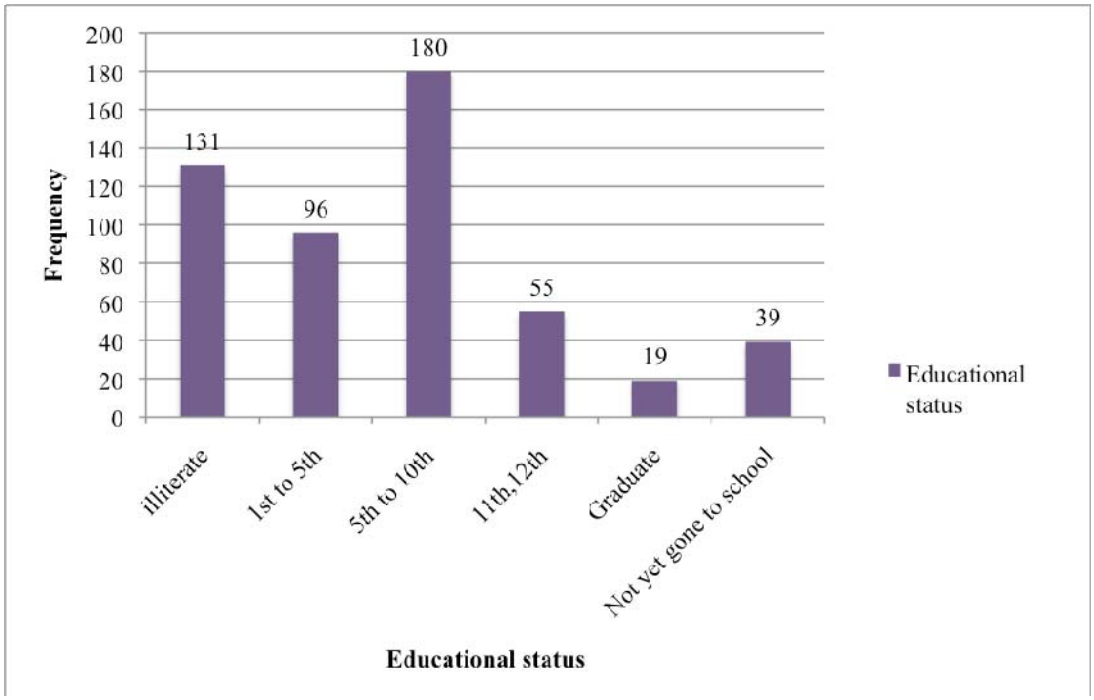


Figure 6 shows that among the 520 participants, 39 participants (7.5%) were children who have not yet gone to school. One fourth (131) of the participants (25.2%) were illiterates. Among the literates, 180 participants (34.5%) were having high school education, 96 participants (18.5%) were having primary education, 55 participants (10.6%) were having higher secondary education and 19 participants (3.7%) were graduates.

6.1.5 Occupational status of the study participants

Figure 7: Occupation status of the study participants (N=520)

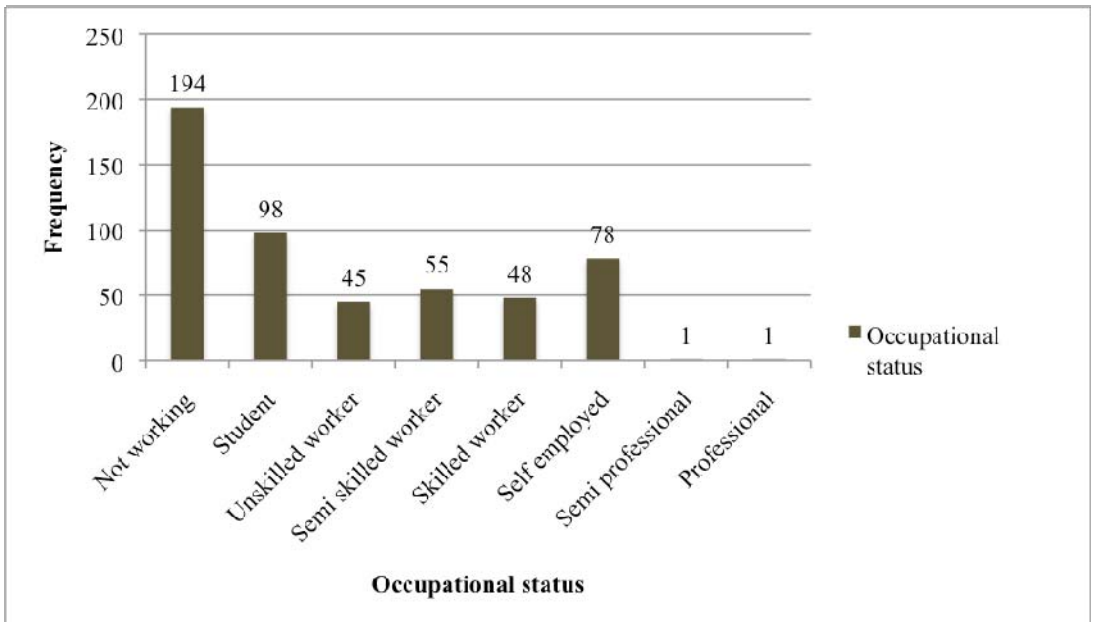


Figure 7 shows that 37.3% of the study population (194 participants) were not working and stayed at home. Among them 7.5% (39 participants) were children who did not yet go to school. 18.8% (98 participants) were students and 15% (78 participants) were self-employed, Unskilled workers were 8.7% (45 participants), semi skilled workers were 10.6% (55 participants) and skilled workers were 9.2% (48 participants). Only 0.2% (1 person) was a semi professional and 0.2% (1 person) was a professional by occupation.

6.1.6 Socio economic Status

The per capita income was calculated from the total family monthly income mentioned by the participants and socioeconomic classification was done based on Modified BG Prasad scale for April 2014 (Annexure 3). From table 6, it has been observed that no households belonged to class I, 25.2% of the households belonged to class II, 29.9% to class III, 34.6% to class IV and 10.3% to class V.

Table 6: Socio economic distribution of households in the study

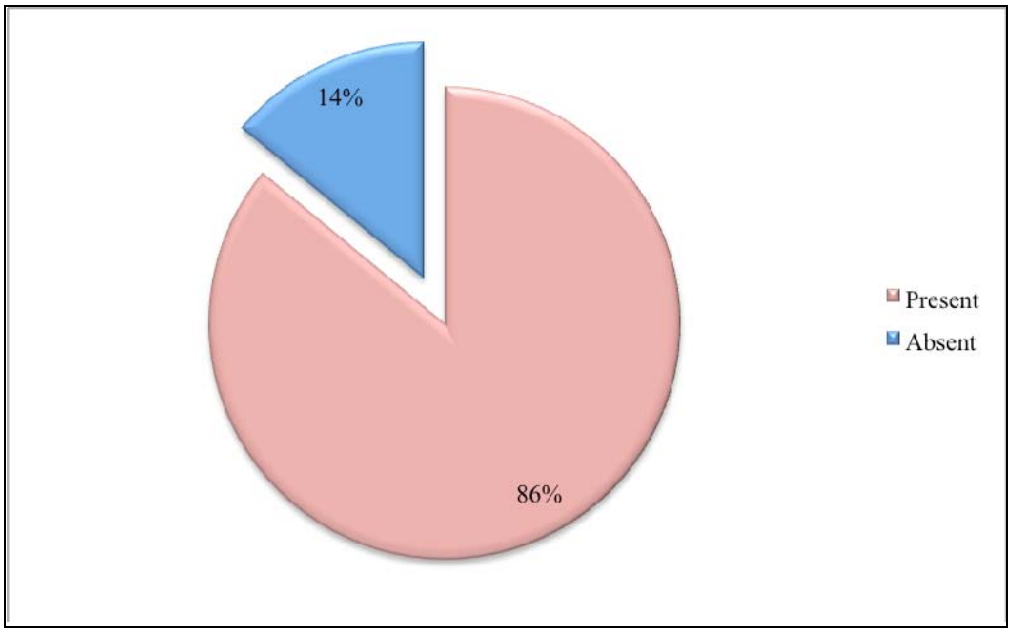
Per capita income (Rs./m)	SES	Number of households (N=107)	Percentage
5090 & above	Class I	-	-
2545 - 5089	Class II	27	25.2
1527 - 2544	Class III	32	29.9
764 – 1526	Class IV	37	34.6
< 764	Class V	11	10.3
	Total	**107**	**100%**

6.2 Prevalence of Preventable Skin diseases

6.2.1 Prevalence of Preventable Skin diseases among households:

Among the 107 households visited, 92 households (86%) had at least one person suffering from preventable skin diseases and 15 households (14%) did not have any skin disease.

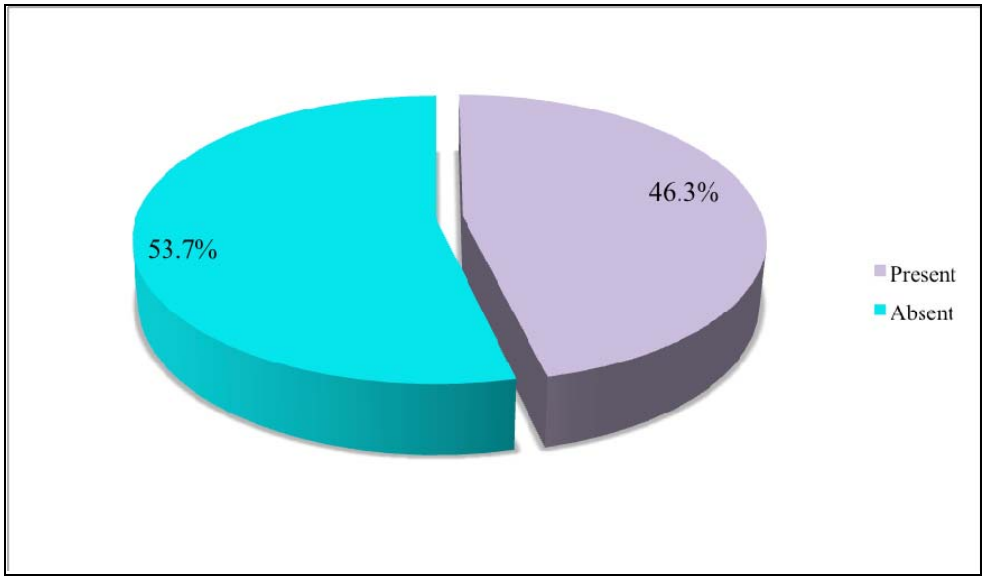
Figure 8: Prevalence of skin disease among households (N=107)



6.2.2 Prevalence of Preventable Skin diseases among individuals residing in the households:

Among the 520 study participants, 241 (46.3%) had preventable skin diseases. (95% Confidence Interval – 42.01% to 50.59%).

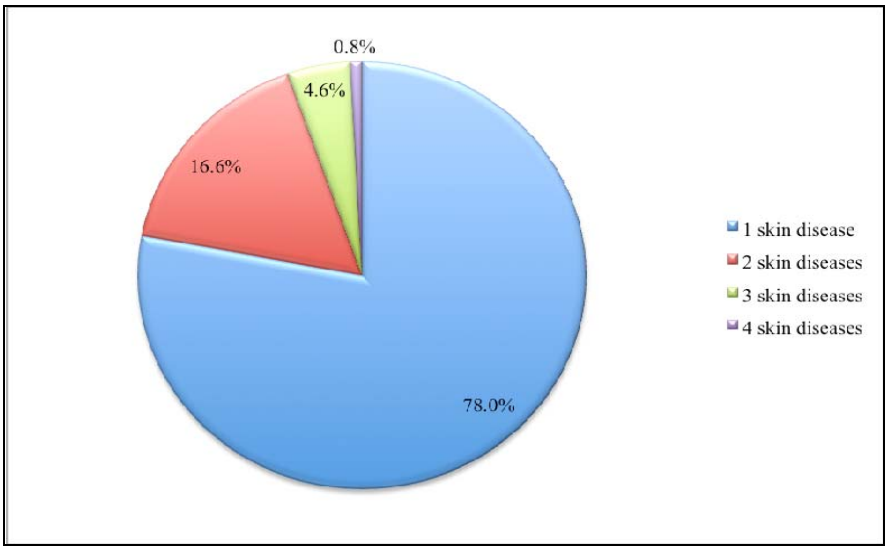
Figure 9: Prevalence of Preventable Skin diseases among individuals residing in the households (N=520)



6.2.3 Number of preventable skin diseases among affected persons:

The number of dermatoses exceeded the number of study participants as some had more than one skin disease in them. Among the 241 participants with preventable skin diseases, 188 (78%) had only 1 disease in them, 40 (16.6%) had two skin diseases in them, 11 (4.6%) had 3 skin diseases in them and 2 (0.8%) had 4 skin diseases in them.

Figure 10: Number of preventable skin diseases among affected persons (N=241)



6.2.4 Prevalence of skin lesions in the study participants:

Table 7: Prevalence of skin diseases among individuals in the households

Skin Diseases	Number of lesions among affected participants (N=309)*	Percentage
Pediculosis	109	35.4%
Tinea unguium	48	15.5%
Tinea corporis	46	14.9%
Impetigo	33	10.7%
Tinea cruris	18	5.8%
Tinea versicolor	15	4.9%
Scabies	15	4.9%
Tinea barbae	6	1.9%
Tinea capitis	4	1.3%
Tinea pedis	4	1.3%
Furunculosis	3	1.0%

Skin Diseases	Number of lesions among affected participants (N=309)*	Percentage
Leprosy	2	0.6%
Tinea faciei	2	0.6%
Carbunculosis	1	0.3%
Folliculitis	1	0.3%
Intertrigo	1	0.3%
Viral wart	1	0.3%
Total	**309**	**100%**

* N=309 as 53 participants had more than 1 preventable skin disease.

Among those who had preventable skin diseases, 109 (35.4%) had pediculosis, 48 (15.5%) had tinea unguium, 46 (14.9%) had tinea corporis, 33 (10.7%) participants had impetigo, 18 (5.8%) had tinea cruris, 15 (4.9%) had tinea versicolor, 15 (4.9%) had scabies, 6 (1.9%) had tinea barbae, 4 (1.3%) had tinea capitis, 4 (1.3%) had tinea pedis, 3 (1%) had furunculosis, 2 (0.6%) had leprosy, 2 (0.6%) participants had tinea faciei, 1 (0.3%) had carbunculosis, 1 (0.3%) had folliculitis, 1 (0.3%) had intertrigo and 1 participant (0.3%) had viral wart.

6.2.5 Classification of preventable skin diseases based on their etiological agent

Based on the etiological agent, the most common skin diseases in the study population were the parasitic infestation in 123 participants (43.9%) followed by fungal infection in 119 participants (42.50%), bacterial infections in 37 participants (13.2%) and viral infection was seen only in 1 (0.4%) participant.

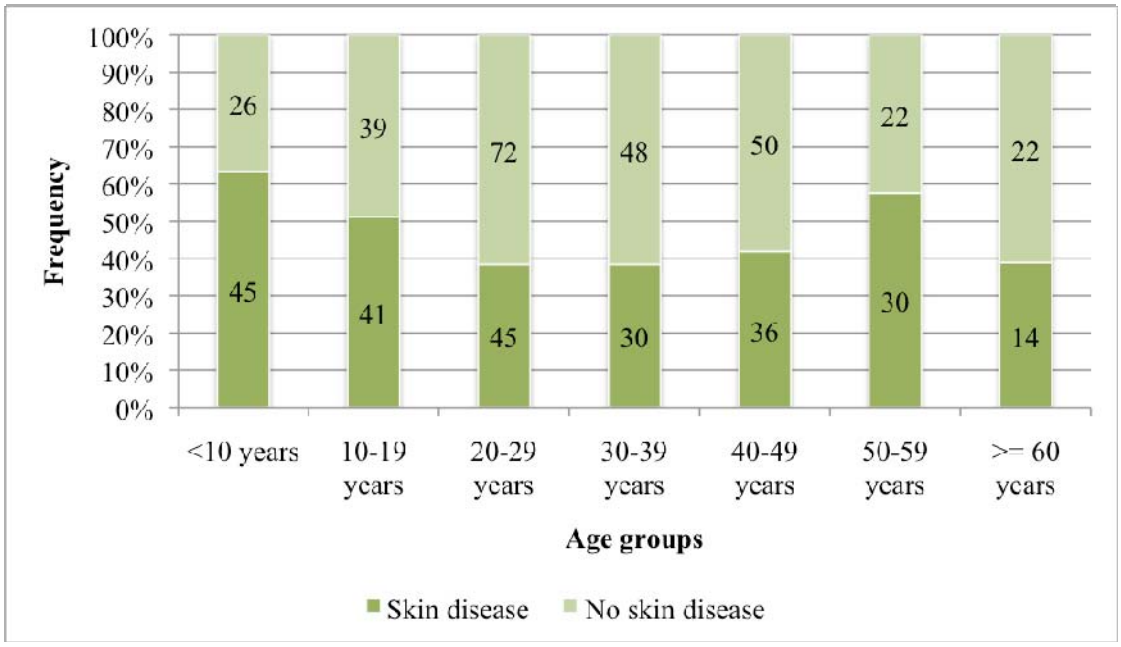
Table 8: Classification of preventable skin diseases based on their etiological agent

Etiology	Number of lesions in affected participants (N=280)*	Percentage
Parasitic	123	43.9
Fungal	119	42.5
Bacterial	37	13.2
Viral	1	0.4
Total	**280**	**100**

* N = 280 as 38 participants had diseases belonging to more than 1 etiological agent.

6.2.6 Age wise distribution of preventable skin diseases:

Figure 11: Age wise distribution of preventable skin diseases (N=520)



The trend of preventable skin diseases is high among children and adolescents with a decrease in middle age followed by a slight rise among people from 50 - 59 years. Figure 11 shows that skin diseases are more common in children and adolescents.

6.2.7 Sex wise distribution of preventable skin diseases:

Figure 12: Sex wise distribution of preventable skin diseases (N=520)

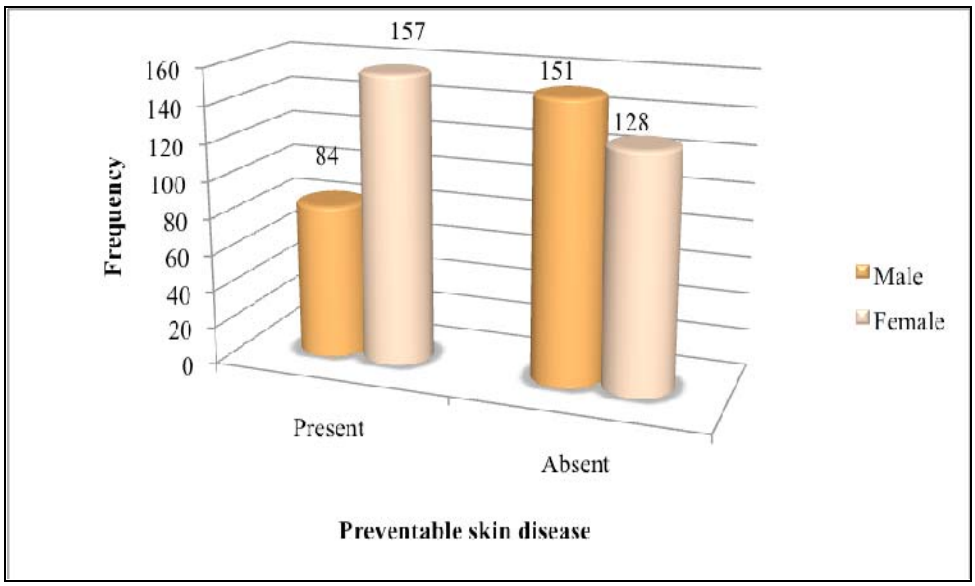
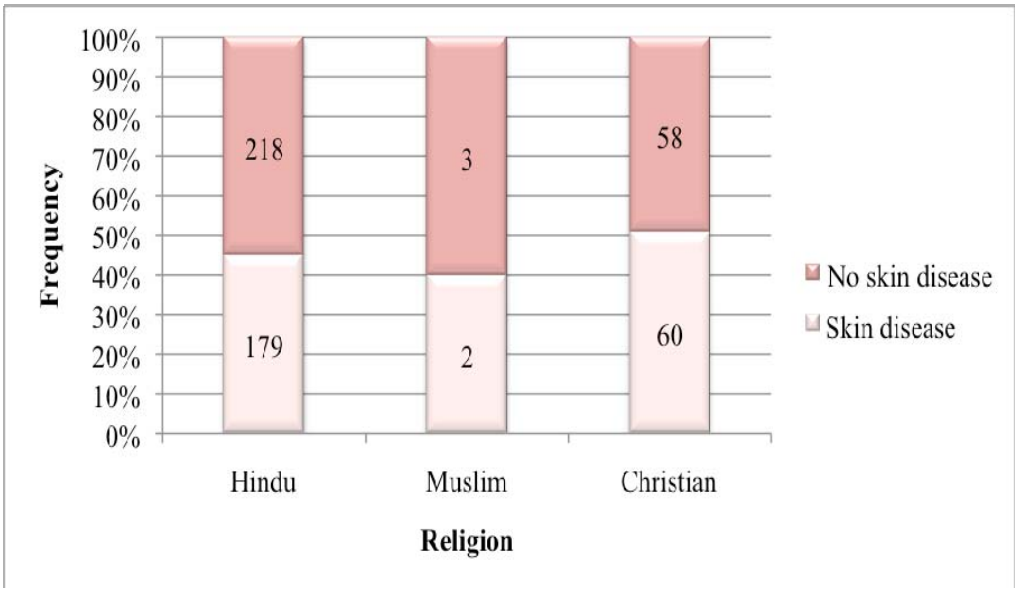


Figure 12 shows that 157 females (55.1%) among the 285 female participants and 84 males (35.7%) among the 235 male participants had preventable skin diseases.

6.2.8 Religion wise distribution of preventable skin diseases

Among the Hindus, 179 (45.1%) had preventable skin diseases, among Muslims, 2 (40%) had preventable skin diseases and among the Christians, 60 (50.8%) had preventable skin diseases. This shows Christians had more preventable skin diseases compared to other religions.

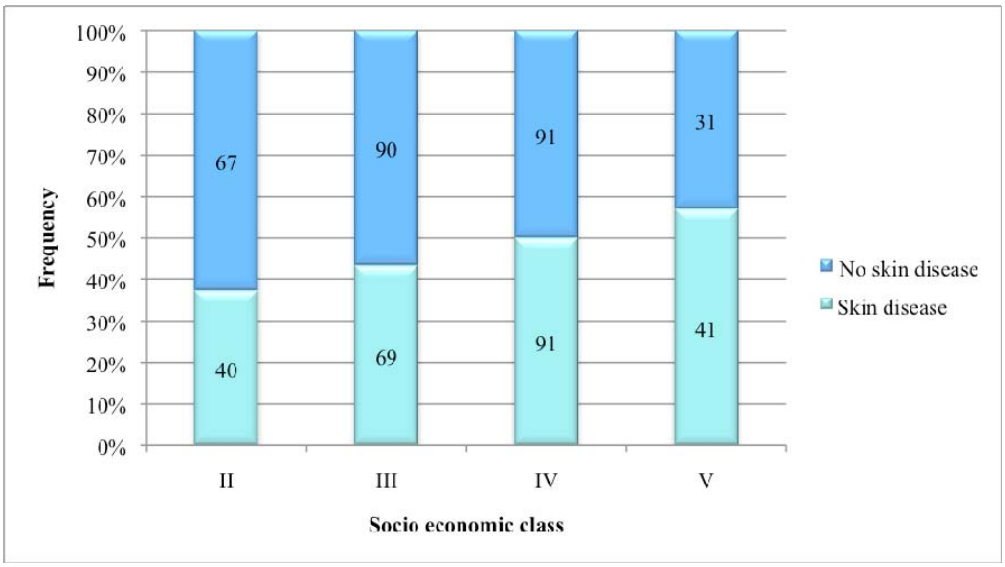
Figure 13: Religion wise distribution of preventable skin diseases (N=520)



6.2.9 Socio economic class wise distribution of preventable skin diseases

Figure 14 shows a rising trend between the prevalence of preventable skin disease and the socio economic status of the participants. As the socio economic class improves, the prevalence of preventable skin diseases decreases.

Figure 14: Socio economic class wise distribution of preventable skin diseases (N=520)



6.2.10 Prevalence of skin complaints among the study participants:

Among the 520 participants, 118 (22.7%) said they had skin complaints. The major symptom was itching (11.2%) followed by hypo pigmentation, ulcer, hyper pigmentation, vesicles and hair loss.

Table 9: Prevalence of skin complaints in the study population

Symptoms of skin diseases	Number of participants (N=520)	Percentage
Itching	58	11.2
Hypo pigmentation	27	5.2
Ulcer	14	2.7
Hyper pigmentation	12	2.3
Vesicles	6	1.1
Sudden Hair loss	1	0.2
No complaints	402	77.3
Total	**520**	**100**

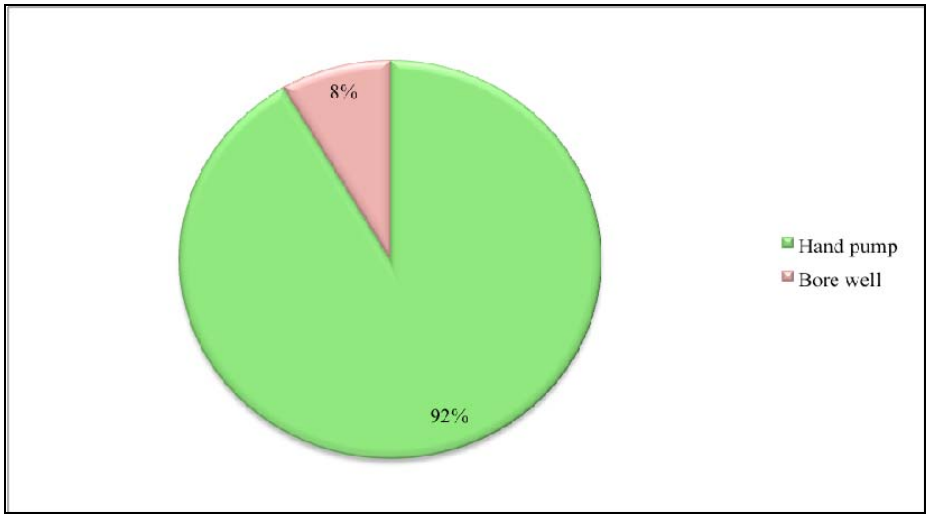
The most common site of itch was the elbow and forearms (14) followed by knees and legs (11), thighs (10), entire body (5), back (4) and hips (4). Among those with complaint of itching, 22 participants (4.2%) complained that itching is more at night.

6.3 Distribution of risk factors among households

6.3.1 Main Source of water supply:

The entire study group said that their primary source of water for domestic use was Corporation water.

Figure 15: Main Source of water for domestic activities among households in the study population (N=107)



The figure shows that the main source of water for washing, bathing and other activities was a hand pump in a common place in 98 households (92%) and bore well in 9 households (8%).

6.3.2 Sufficient water supply:

Table 10: Water requirement among households in the study population

Is the quantity of water sufficient?	Household (N=107)	Percentage
Yes	104	97%
No	3	3%
Grand Total	**107**	**100%**

Table 10 shows that 97% households had sufficient water to satisfy their needs in the present study.

6.3.3 Overcrowding:

Among the 107 households, the number of households living in 1 room was 85 (79%), in 2 rooms was 20 (19%) and in 3 rooms was 2 (2%). with the average number of living rooms per household of 1.28.

Figure 16: Households with overcrowding (N = 107)

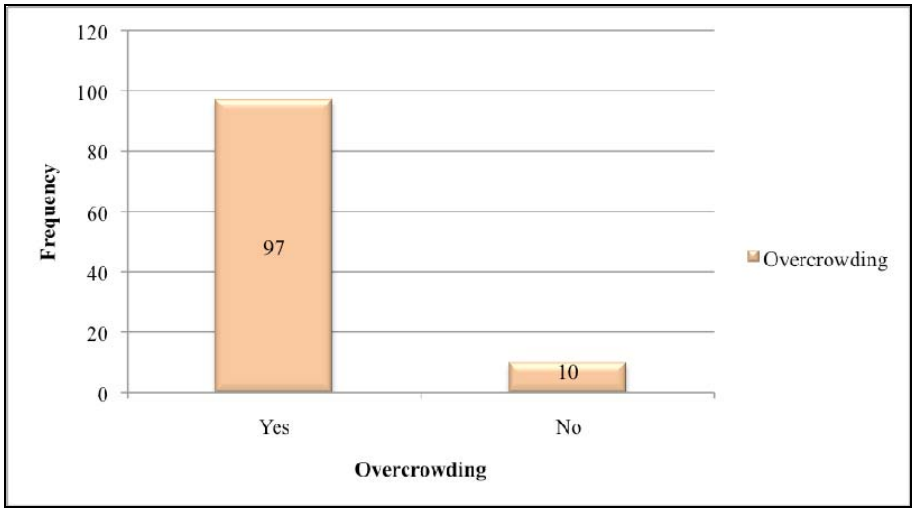
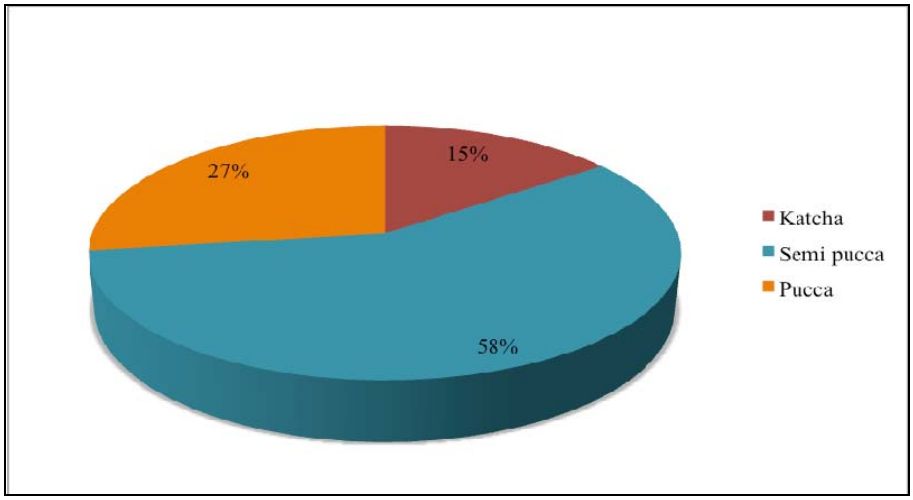


Figure 16 shows that 97 households (90.6%) were overcrowded and only 10 households (9.4%) were not overcrowded.

6.3.4 Type of house:

Figure 17: Type of house among households (N=107)



Among the 107 households, 16 households (15%) live in katcha houses, more than half (62) of the households (58%) live in semi pucca houses and 29 households (27%) live in pucca houses.

6.3.5 Domestic animals:

Figure 18: Households with domestic animals (N = 107)

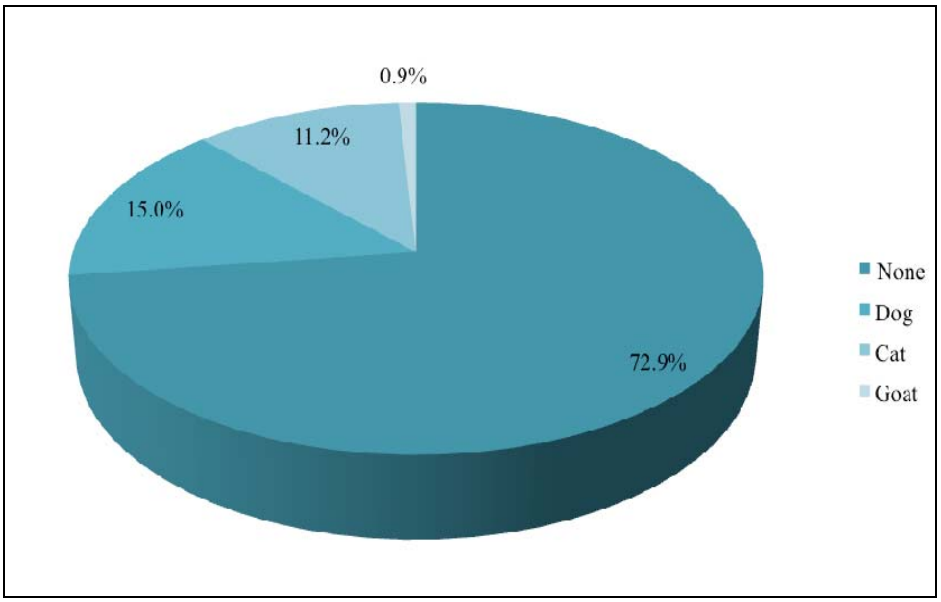


Figure 18 shows that 78 households (72%) had no domestic animals, 16 households (16%) tamed a dog, 12 households (11%) had a cat and 1 (1%) household had a goat.

6.4 Distribution of risk factors among individuals residing in households

6.4.1 Distribution of individuals sharing their sleeping space

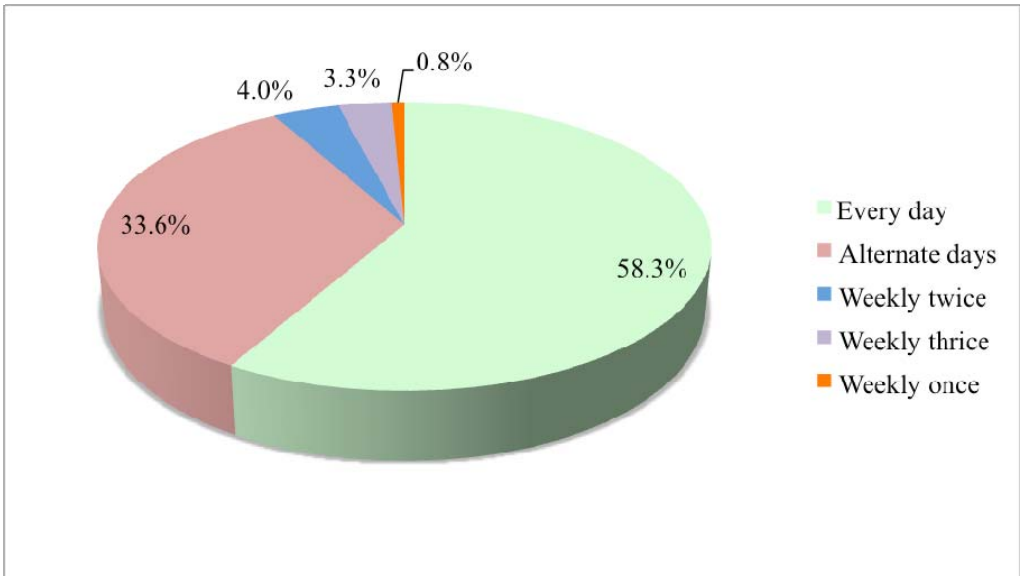
Table 11: Distribution of individuals sharing their sleeping space

Sharing the sleeping space	Number of participants (N=520)	Percentage
Yes	437	84
No	83	16
Total	**520**	**100**

Among individuals, 437 (84%) were sleeping in the same room and 83 (16%) were not sharing the same room for sleeping. The average number of persons per sleeping room is 1.2.

6.4.2 Frequency of bathing:

Figure 19: Distribution of frequency of bathing among the study participants (N=520)



In the study population, 303 individuals (58.3%) bathe everyday, 175 (33.6%) bathe on alternate days, 17 (3.3%) bathe three days a week, 21 (4%) bathe only 2 days a week and 4 (0.8%) bathe only once a week.

6.4.3 Place of bathing:

Table 12: Distribution of place of bathing by the study participants

Place of bathing	Number of participants (N=520)	Percentage
Bathroom	353	67.9
Near pump	159	30.5
Near wells	6	1.2
Natural water collections	2	0.4
Total	**520**	**100**

Table 12 shows that 353 study participants (67.9%) took bath in bathrooms, 159 participants (30.5%) took bath beside pump, 6 participants (1.2%) took bath beside wells and 2 participants (0.4%) took bath in natural water collections.

6.4.4 Frequency of washing hair:

Figure 20: Frequency of washing hair by the study participants (N=520)

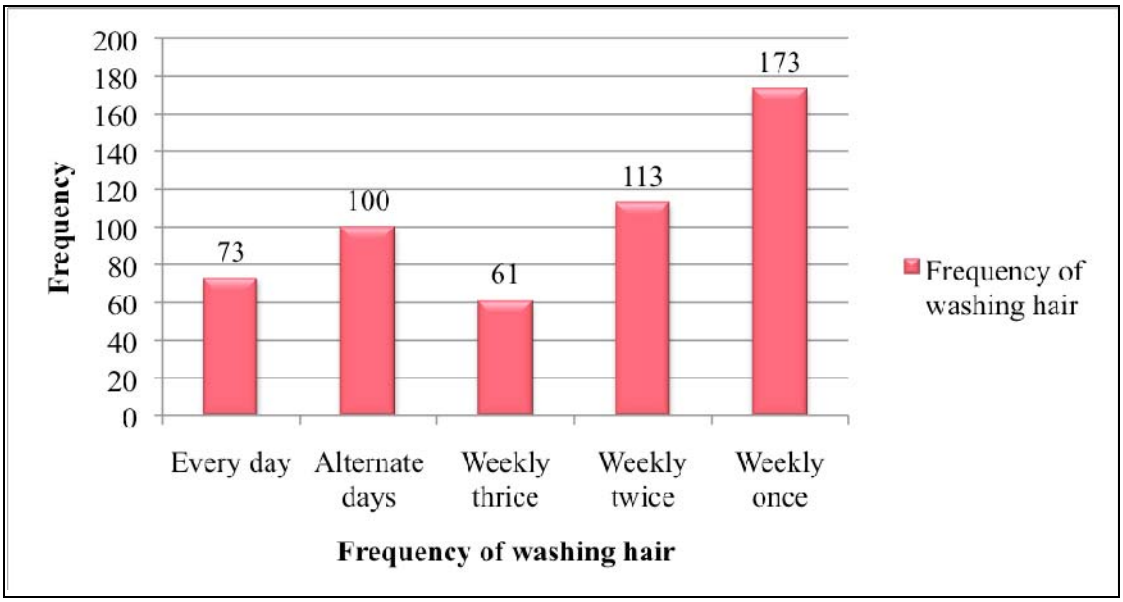


Figure 20 shows that 73 participants (14%) washed their hair daily, 100 participants (19.2%) washed their hair on alternate days, 61 participants (11.8%) washed their hair three days a week, 113 participants (21.7%) washed their hair twice a week and 173 participants (33.3%) washed their hair once a week.

6.4.5 Wearing washed clothes daily:

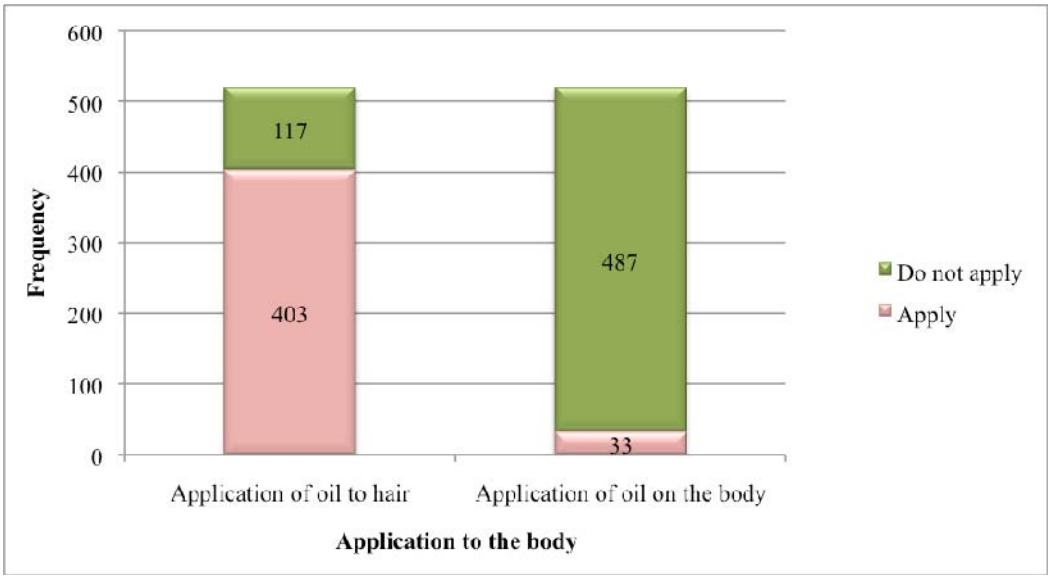
Table 13: Habit of wearing washed clothes daily by the study participants

Wear washed clothes daily	Number of participants (N=520)	Percentage
Yes	345	66.3
No	175	33.7
Total	**520**	**100**

In the study, more than half of the participants (66.3%) wore washed clothes daily and 175 (33.7%) did not change their clothes daily.

6.4.6 Application of oil on the body and hair:

Figure 21: Application of oil on the body and hair by the study participants (N=520)



Among the study participants, 403 (77.5%) applied oil to their hair regularly while the remaining 117 (22.5%) did not apply oil to their hair. 33 participants (6.3%) had the habit of applying oil to their body. Remaining 487 participants (93.7%) did not have the habit of applying oil to the body.

6.4.7 Place of shaving:

Table 14: Distribution of place of shaving among the study participants

Place of shaving	Number of participants (N=520)	Percentage
Home	47	9
Barber shop	153	29.4
Both	25	4.8
Do not shave	295	56.8
Total	**520**	**100**

Table 14 shows that 47 (9%) study participants shave in their homes, 153 (29.4%) shave in barbershop and 25 (4.8%) sometimes shave at home and sometimes at the barbershop.

6.4.8 Sharing things:

Table 15: Habit of sharing things in the study population

Share blade	Number of participants (N=225)	Percentage
Yes	45	20
No	180	80
Share soaps	**Number of participants (N=520)**	**Percentage**
Yes	338	65
No	182	35

Share towels	Number of participants (N=520)	Percentage
Yes	356	68.5
No	164	31.5
Share clothes	**Number of participants (N=520)**	**Percentage**
Yes	141	27.1
No	379	72.9
Share combs	**Number of participants (N=520)**	**Percentage**
Yes	381	73.3
No	139	26.7

Table 15 shows that among those who shave, only one fifth (45) of the participants (20%) had the habit of sharing blades while shaving, while 180 participants (34.8%) did not share their blades with others. It was found that 338 participants (65%) did not use a separate soap for themselves and shared their soap with their family members and 182 participants (35%) used separate soaps for them**.** In the present study, 356 (68.5%) shared their towels with their family members, while 164 (31.5%) did not share their towel with others.

Table shows that 141 (27.1%) participants shared their clothes with their family members, while 379 (72.9%) did not share their clothes with others. The study shows that 381 participants (73.3%) share their combs with their family members and friends, while 139 participants (26.7%) used separate combs for them.

6.4.9 Habit of cutting nails regularly

Figure 22: Habit of cutting nails regularly among the study participants (N=520)

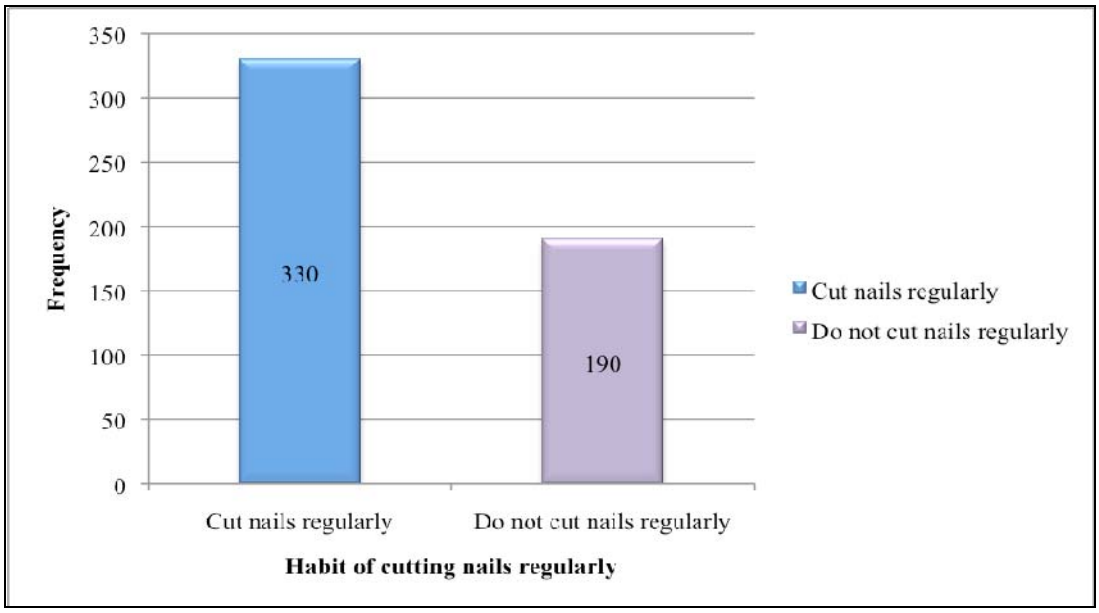


Figure 22 shows that 330 participants (63.5%) had the habit of cutting nails regularly and 190 participants (36.5%) did not cut their nails regularly.

6.4.10 Hand washing practices in the study population

Table 16: Hand washing practices in the study population

Hand washing practices	Number of participants	Percentage
Wash hands after playing (N=136)		
Yes	46	33.8
No	90	66.2
Wash hands after coming home from outside (N= 520)		
Yes	224	43.1
No	296	56.9

Hand washing practices	Number of participants	Percentage
Wash hands before meals (N=520)		
Yes	184	35.4
No	336	64.6
Wash hands after meals (N= 520)		
Yes	140	26.9
No	380	73.1
Wash hands before cooking (N=233)		
Yes	74	31.8
No	159	68.2
Wash hands after cooking (N=233)		
Yes	62	26.6
No	171	73.4
Wash hands after using toilet (N=520)		
Yes	413	79.4
No	107	20.6

Table shows that among the study participants, 224 participants (43.1%) washed their hands after coming home from outside, 184 participants (35.4%) washed their hands before meals, 140 participants (26.9%) washed their hands after meals and 413 participants (79.4%) washed their hands after using the toilet. Among those who played, only 46 participants (33.8%) washed their hands after playing. Among those who cooked, 74 persons (31.8%) washed their hands before cooking and 62 participants (26.6%) washed hands after cooking.

6.4.11 Wearing footwear while going outside:

Figure 23: Habit of always wearing footwear while going outside among the study participants (N=520)

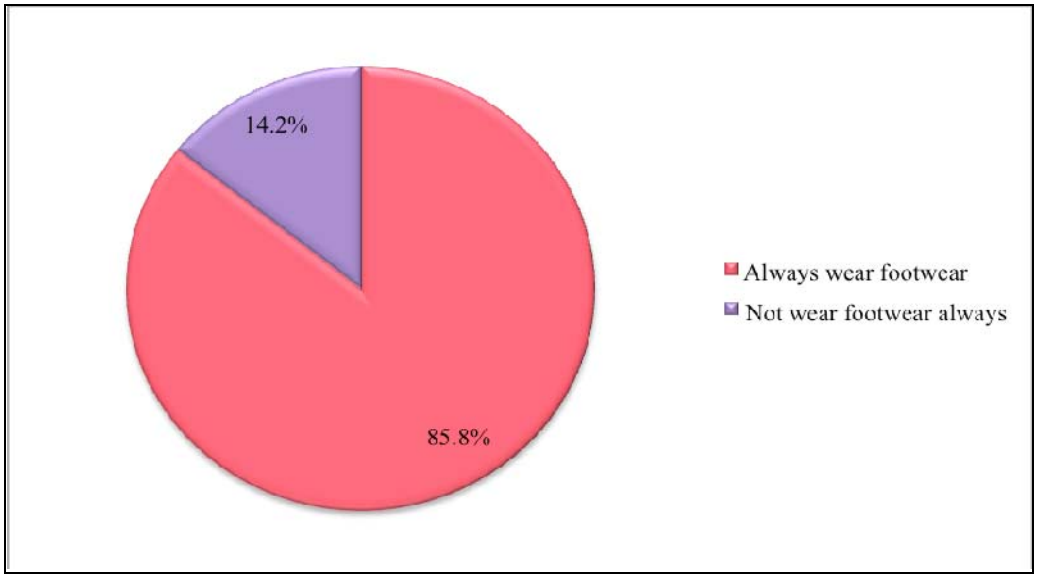
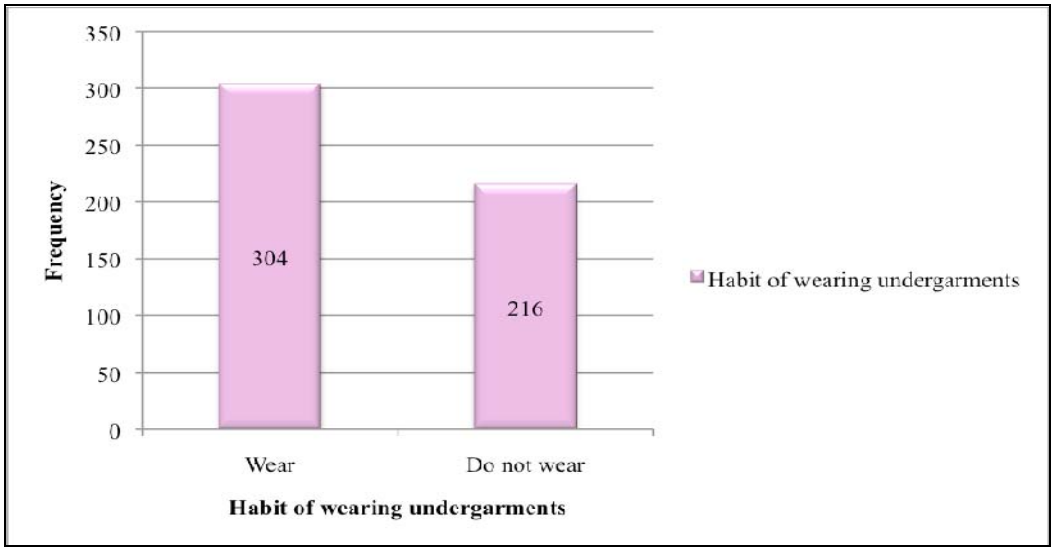


Figure shows that among the study participants, 446 participants (85.8%) had the habit of always wearing footwear while going outside and 74 participants (14.2%) did not have the habit of wearing footwear at all.

6.4.12 Habit of wearing undergarments among the study participants:

Figure 24: Habit of wearing undergarments among the study participants (N=520)



Among the study participants, 304 participants (58.5%) had the habit of wearing undergarments and 216 participants (41.5%) did not have the habit of wearing undergarments**.**

6.4.13 Diabetes Mellitus:

Table 17: Percentage of Diabetics in the study population

Diabetes Mellitus	Frequency (N=520)	Percentage
Yes	54	10.4
No	466	89.6
Total	**520**	**100**

Among the study participants, 54 (10.4%) gave positive history of Diabetes Mellitus.

6.4.14 General Appearance score:

The total score to assess the general appearance from head to foot was 13. It is a measure of personal hygiene of the participants. Participants who had their score of 6 and less were said to have poor personal hygiene, 7 to 10 were said to have fair personal hygiene and score more than 10 with good personal hygiene.

Figure 25: General appearance score among the study population (N=520)

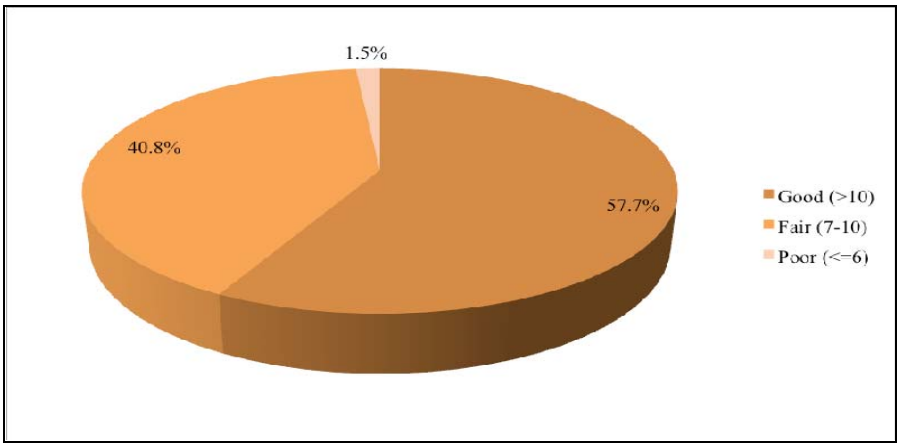


Figure shows that 300 participants (58%) had good general appearance score, 203 participants (39%) had fair score and 17 participants (3%) had poor general appearance score.

6.4.15 Colour of the skin:

The colour of the skin was compared and assessed using Fitzpatrick skin colour scale.

Figure 26: Colour of the skin among the study population (N=520)

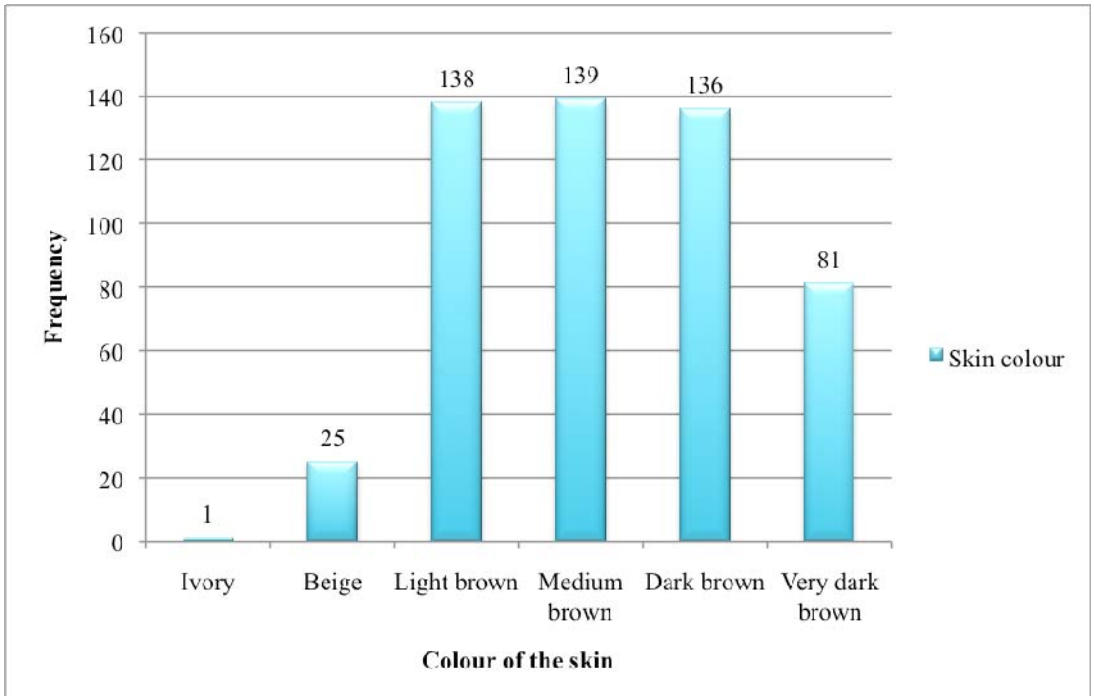


Figure shows that 0.2% (1) were of ivory colour, 4.8% (25) were of beige colour, 15.6% (81) were in light brown colour, 26.7% (139) were in medium brown colour, 26.2% (136) were dark brown and 26.5% (138) were very dark brown.

6.5 Association of skin disease with socio demographic variables

6.5.1 Socio demographic variables and preventable skin diseases:

Table 18: Cross tabulation between socio demographic variables and preventable skin diseases

Socio demographic Variable		Preventable Skin disease		Total	Chi square test	df	p value
		Present	Absent				
Age group	<10 years	45 (63.40%)	26 (36.60%)	71	18.127	6	0.006 (S)
	10 – 19 years	41 (51.20%)	39 (48.80%)	80			
	20-29 years	45 (38.50%)	72 (61.50%)	117			
	30-39 years	30 (38.50%)	48 (61.50%)	78			
	40-49 years	36 (41.90%)	50 (58.10%)	86			
	50-59 years	30 (57.70%)	22 (42.30%)	52			
	>= 60 years	14 (38.90%)	22 (61.10%)	36			
Sex	Male	84 (35.7%)	151 (64.30%)	235	19.380	1	< 0.001 (S)
	Female	157 (55.1%)	128 (44.90%)	285			
Religion	Hindu	179 (45.1%)	218 (54.9%)	397	1.368*		0.514 (>0.05) (NS)
	Muslim	2 (40.0%)	3 (60.0%)	5			
	Christian	60 (50.8%)	58 (49.2%)	118			
Socio economic status	2	40 (37.4%)	67 (62.6%)	107	8.243	3	0.041 (S)
	3	69 (43.4%)	90 (56.6%)	159			
	4	91 (50%)	91 (50%)	182			
	5	41 (56.9%)	31 (43.1%)	72			
Total		241 (46.3%)	279 (53.7%)	520			

* - Fisher’s exact test

In this study, it is noted that age is significantly associated with prevalence of preventable skin diseases with greater prevalence in children and adolescents. Females had a higher prevalence of preventable skin diseases (55.1%) compared to males (35.7%). Christians had high prevalence of preventable skin diseases (50.8%) compared to Hindus and Muslims. It is evident from the table, that the prevalence of preventable skin diseases is inversely proportional to the socio economic status of the participants. The prevalence of skin diseases decreased with upgrading of social class. The association between age groups, sex of the individual and socio economic classes and presence of preventable skin diseases is statistically significant and the association with religious groups is not statistically significant.

6.5.2 Age group and preventable skin diseases

Table 19: Cross tabulation between age group and preventable skin diseases

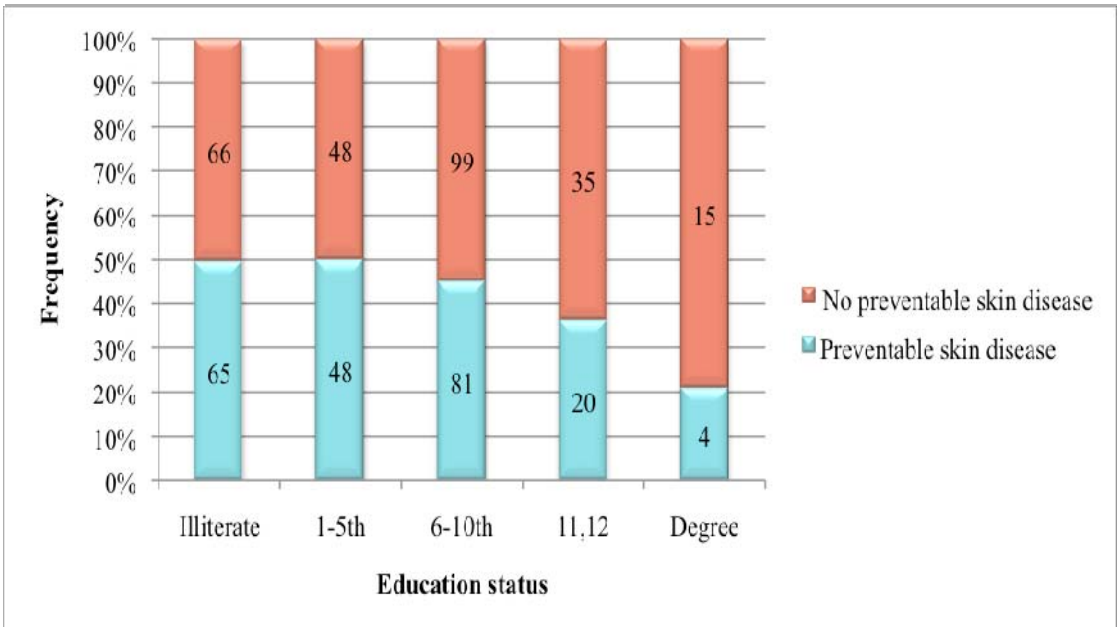
Age group	Preventable skin diseases		Total
	Present	Absent	
< 15 years	74 (63.80%)	42 (36.20%)	116
> = 15 years	167 (41.30%)	237 (58.70%)	404
Total	**241 (46.30%)**	**279 (53.70%)**	**520**

Chi Square value = 18.277 (df=1) p value = <0.001(S)

The prevalence of preventable skin diseases is greater in age less than 15 years. A statistically significant association was found between prevalence of preventable skin diseases and age less than 15 years.

6.5.3 Education and preventable skin diseases

Figure 27: Educational status and prevalence of preventable skin diseases (N=481)



Fisher's Exact Test = 8.1281 **p value=0.086 (>0.05) (NS)**

The children who have not yet gone to school (39) are excluded from the analysis of the association between the educational status and preventable skin diseases. Figure shows that as the level of literacy increases, the prevalence of preventable skin diseases decreases. But this inverse relationship was not statistically significant.

6.6 Association of risk factors and socio demographic variables

6.6.1 Educational status of head of family and type of house:

Table 20: Cross tabulation between educational status of head of family and type of house

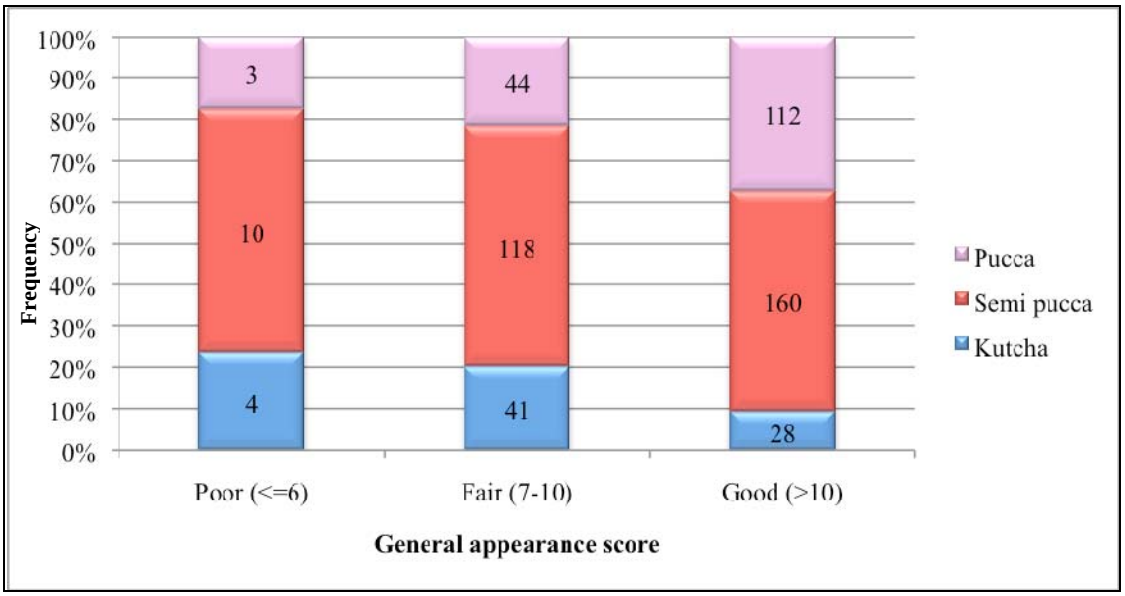
Educational status	Type of house			Total
	Katcha	Semipucca	Pucca	
Illiterate	10 (19.6%)	32 (62.7%)	9 (17.7%)	51
1st - 5th Std	5 (21.7%)	13 (56.5%)	5 (21.8%)	23
6th - 10th Std	1 (3.5%)	17 (58.6%)	11 (37.9%)	29
11th and 12th	0	0	3 (100%)	3
Degree	0	0	1 (100%)	1
Total	**16 (15%)**	**62 (57.9%)**	**29 (27.1%)**	**107**

Fisher's Exact Test: 16.140 **p value = 0.017 (S)**

The educational status of the decision maker of the family has an effect on the type of house they live in. As the educational status of the head of the family increases, the type of house they dwell in improves. This association was found to be statistically significant.

6.6.2 General appearance scores and type of house:

Figure 28: Cross tabulation between general appearance scores and type of house



Fisher's Exact Test = 22.743 **p value= <0.001 (S)**

There is an inverse relationship between the general appearance scores and the type of house the participants dwell in. As the score improves the type of house they live in improves. This association was found to be statistically significant.

6.7 Association of skin disease with risk factors

6.7.1 Type of house and preventable skin diseases:

Table 21: Cross tabulation between type of house and preventable skin diseases

House type	Preventable skin disease	No Preventable skin disease	Total
Katcha	47 (64.4%)	26 (35.6%)	73
Semipucca	126 (43.8%)	162 (56.2%)	288
Pucca	68 (42.8%)	91 (57.2%)	159
Total	**241 (46.3%)**	**279 (53.7%)**	**520**

Chi Square value = 11.151 **(df=2)** **p value=0.004 (S)**

It was found from the table that people living in katcha house had higher prevalence of preventable skin diseases compared to people living in semi pucca and pucca houses. This association was found to be highly significant.

6.7.2 Overcrowding and preventable skin diseases in households:

Table 22: Cross tabulation between overcrowding and preventable skin diseases

Overcrowding	Preventable skin disease		Total
	Present	Absent	
Yes	87 (89.7%)	10 (10.3%)	97
No	5 (50%)	5(50%)	10
Total	**92 (86%)**	**15(14%)**	**107**

Chi Square value = 11.848 (df=1) p value <0.001(S)

Table shows that that households with overcrowding had statistically significant higher prevalence of preventable skin diseases compared to households without overcrowding.

6.7.3 Place of bathing and preventable skin diseases

Table 23: Cross tabulation between place of bathing and preventable skin diseases

Bathing place	Preventable skin disease		Total
	Present	Absent	
Bathroom	152 (43.1%)	201 (56.9%)	335
Near wells	2 (33.3%)	4 (66.7%)	6
Near pump	87 (54.7%)	72 (45.3%)	159
Natural water collections	0 (0%)	2 (100%)	2
Total	**241 (46.3%)**	**279 (53.7%)**	**520**

Fisher's exact test value = 7.744 p value=0.031 (S)

Table shows that more than half of the people who take bath near pumps in their area had preventable skin diseases. The association was found to be statistically significant.

6.7.4 Bathing frequency and preventable skin diseases

Table 24: Cross tabulation between bathing frequency and preventable skin diseases

Frequency of bathing	Preventable skin disease		Total
	Present	Absent	
Taking bath daily	121 (39.9%)	182 (60.1%)	303
Not taking bath daily	120 (55.3%)	97 (44.7%)	217
Total	**241 (46.3%)**	**279 (53.7%)**	**520**

Chi Square value = 12.006 (df=1) p value<0.001 (S)

Table shows that more than half of those who do not take bath daily had skin diseases. There is a statistically significant relationship between the frequency of bathing and preventable skin diseases.

6.7.5 Habit of wearing washed clothes daily and preventable skin diseases

Among those who did not have the habit of wearing washed clothes daily (175), 83 (47.4%) had preventable skin diseases, while among those who had the habit of wearing washed clothes daily (345), 158 (45.8%) had preventable skin diseases. This difference was not statistically significant. (P value=0.724)

6.7.6 General appearance scores and preventable skin diseases:

Table 25: Cross tabulation between general appearance scores and preventable skin diseases

General appearance scores	Preventable skin disease		Total
	Present	Absent	
Poor (<=6)	12 (70.6%)	5 (29.4%)	17
Fair (7-10)	119 (58.6%)	84 (41.4%)	203
Good (>10)	110 (36.7%)	190 (63.3%)	300
Total	**241 (46.3%)**	**279 (53.7%)**	**520**

Chi square test = 27.621 (df=2) p value= <0.001 (S)

There is an inverse relationship between the general appearance scores and the presence of preventable skin diseases. As the score improves the prevalence decreases. This association was found to be statistically significant.

6.7.7 Sharing things and preventable skin diseases

Table 26: Cross tabulation between sharing things and preventable skin diseases

Variable		Preventable Skin disease		Total	Chi square test	df	p value
		Present	Absent				
Share towel	**Yes**	167 (46.9%)	189 (53.1%)	356	0.144	1	0.706
	No	74 (45.1%)	90 (54.9%)	164			
Share soap	**Yes**	158 (46.7%)	180 (53.3%)	338	0.062	1	0.854
	No	83 (45.6%)	99 (54.4%)	182			

Variable		Preventable Skin disease		Total	Chi square test	df	p value
		Present	Absent				
Share sleeping space	Yes	197 (45.1%)	240 (54.9%)	437	1.765	1	0.184
	No	44 (53%)	39 (47%)	83			
Share clothes	Yes	64 (45.4%)	77 (54.6%)	141	0.071	1	0.843
	No	177 (46.7%)	202 (53.3%)	379			
Total		**241 (46.3%)**	**279 (53.7%)**	**520**			

No statistically significant association was found between sharing things and preventable skin diseases.

6.7.8 Application of oil to body and preventable skin diseases:

Table 27: Cross tabulation between Application of oil to body and preventable skin diseases

Application of oil to body	Preventable skin disease		Total
	Present	Absent	
Yes	9 (27.3%)	24 (72.7%)	33
No	232 (47.6%)	255 (52.4%)	487
Total	**241 (46.3%)**	**279 (53.7%)**	**520**

Chi square test = 5.155 (df=1) p value= 0.029 (S)

Table shows that preventable skin diseases were more among participants who did not apply oil to their body regularly. This association was found to be statistically significant.

6.7.9 Skin colour and preventable skin diseases:

Table 28: Cross tabulation between skin colour and preventable skin diseases

Skin colour	Preventable Skin disease					
	Present		Absent		Total	
	N	%	N	%	N	%
Ivory	0	.0	1	100.0	1	100.0
Beige	12	48.0	13	52.0	25	100.0
Light brown	56	40.6	82	59.4	138	100.0
Medium brown	64	46	75	54.0	139	100.0
Dark brown	68	50.0	68	50.0	136	100.0
Very dark brown	41	50.6	40	49.4	81	100.0
Total	**241**	**46.3**	**279**	**53.7**	**520**	**100.0**

Fisher's exact test value = 4.031 **p value= 0.544 (>0.05) (NS)**

The study shows that there is no statistically significant association between the colour of the skin and preventable skin diseases.

6.8 Association between individual diseases and modifiable risk factors

6.8.1 Pediculosis

Table 29: Cross tabulation between hair hygiene related risk factors and pediculosis

Variable		Pediculosis		Total	Chi Square	df	p-value
		Present	Absent				
Frequency of washing hair	Every day	7 (9.6%)	66 (90.4%)	73	11.442	4	**0.022 (S)**
	Alternate days	18 (18.0%)	82 (82.0%)	100			
	Weekly thrice	11 (18.0%)	50 (82.0%)	61			
	Weekly twice	25 (22.1%)	88 (77.9%)	113			
	Weekly once	48 (27.7%)	125 (72.3%)	173			
General appearance score	Poor	7 (41.2%)	10 (58.8%)	17	22.020	2	**<0.001 (S)**
	Fair	60 (29.8%)	143 (70.4%)	203			
	Good	42 (14%)	258 (86%)	300			
Sharing comb	Yes	84 (22.0%)	297 (78.%)	381	1.014	1	0.314
	No	25 (18.0%)	114 (82.0%)	139			
Total		**109 (21%)**	**411 (79%)**	**520**			

Prevalence of pediculosis was less among participants who washed their hair daily. A statistically significant association was found between frequency of hair washing and pediculosis and general appearance score and pediculosis.

6.8.2 Tinea barbae

Table 30: Cross tabulation between facial hygiene related risk factors and Tinea barbae

Variable		Tinea barbae		Total	Fisher's Exact test	p-value
		Present	Absent			
Place of shaving	Home	1 (2.1%)	46 (97.9%)	47	9.000	0.013 (S)
	Barber shop	2 (1.3%)	151 (98.7%)	153		
	Do not shave	1 (0.3%)	294 (99.7%)	295		
	Both	2 (8%)	23 (92%)	25		
Total		6 (1.2%)	514 (98.8%)	520		

Prevalence of tinea barbae was more among the participants who shaved in the barbershop. This association was found to be statistically significant.

6.8.3 Impetigo

6.8.3.1 Washing hands and impetigo:

Table 31: Cross tabulation between Washing hands after coming home and impetigo

Washing hands after coming from outside	Impetigo		Total
	Present	Absent	
Yes	6 (2.7%)	218 (97.3%)	224
No	27 (9.1%)	269 (90.9%)	296
Total	33 (6.3%)	487 (93.7%)	520

Chi square test = 8.906 (df=1) p value= 0.003 (S)

Impetigo was present in 2.7% of the participants who washed their hands and in 9.1% participants who did not wash their hands after coming from outside. This association was found to be statistically significant.

6.8.3.2 Type of house and impetigo:

Table 32: Cross tabulation between impetigo and type of house

Type of house	Impetigo		Total
	Present	Absent	
Katcha	11 (15.1%)	62 (84.9%)	73
Semi pucca	13 (4.5%)	275 (95.5%)	288
Pucca	9 (5.7%)	150 (94.3%)	159
Total	**33 (6.3%)**	**487 (93.7%)**	**520**

Fisher's Exact test = 9.212 **p value=0.009 (S)**

More participants who lived in katcha house had impetigo compared to participants living in semi pucca and pucca houses. This association was found to be statistically significant.

6.8.3.3 General appearance score and Impetigo

Table 33: Cross tabulation between General appearance score and Impetigo

General appearance score	Impetigo		Total
	Present	Absent	
Poor	4 (23.5%)	13 (76.5%)	17
Fair	21 (10.3%)	182 (89.7%)	203
Good	8 (2.7%)	292 (97.3%)	300
Total	33(6.30%)	487(93.70%)	520

Fisher's Exact test = 19.278 **p value= <0.001 (S)**

Table 33 shows a statistically significant relationship between impetigo and the general appearance of the participants**.**

6.8.4 Scabies:

Scabies was more among people who share their sleeping space and among households with overcrowding. These associations were not statistically significant.

6.8.5 Carbuncle

It was found that the case of carbuncle had a positive history of Diabetes Mellitus. Not all cases with a positive history of Diabetes Mellitus had Carbuncle.

6.9 Logistic regression

6.9.1 Factor associated with preventable skin diseases by multivariate analysis:

Table 34: Logistic regression analysis of the factors associated with preventable skin diseases

Risk factors	B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I. for EXP(B)	
							Lower	Upper
Age group	0.982	0.232	17.94	1	0.000	2.669	1.694	4.203
Socio economic class	-0.191	0.103	3.44	1	0.064	0.826	0.675	1.011
Type of house	0.135	0.159	0.717	1	0.397	1.144	0.837	1.564
Place of bathing	0	0.111	0	1	0.997	1	0.805	1.242
Frequency of bathing	-0.532	0.196	7.392	1	0.007	0.587	0.4	0.862
Applying oil to the body	-0.885	0.438	4.084	1	0.043	0.413	0.175	0.974
General appearance score	0.703	0.179	15.396	1	0.000	2.02	1.422	2.871
Constant	-0.548	1.168	0.22	1	0.639	0.578		

a. Variable(s) entered on step 1: Age groups, socio economic class, type of house, place of bathing, frequency of bathing, habit of applying oil to the body and general appearance score

Binary logistic regression analysis showed that the difference in the prevalence of preventable skin diseases between age groups, frequency of bathing, habit of applying oil to hair and the general appearance scores continues to be statistically significant even after adjusting for other potential risk factors like type of house, place of bathing and socio-economic class. The adjusted odds ratio for developing preventable skin diseases among children less than 15 years was 2.67 (95%CI-1.694- 4.203). The adjusted odds ratio for developing preventable skin diseases among those who do not take bath daily was 0.59 (95%CI-0.4-0.862). The adjusted odds ratio for developing preventable skin diseases among those with poor hygiene score was 2.02 (95%CI-1.422- 2.871).

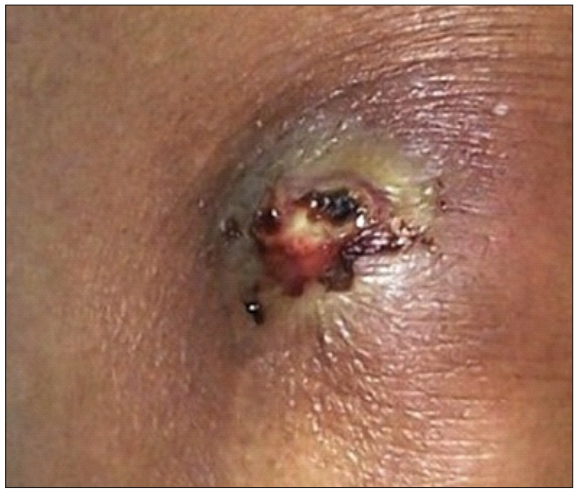
Colour Plates

Pediculosis capitis

Impetigo

Scabies

Intertrigo



Furunculosis

Folliculitis

Tinea cruris

Tinea unguium

Tinea corporis

Tinea capitis

Tinea barbae

Tinea versicolor

Leprosy

Tinea pedis

Discussion

7. DISCUSSION

The current study is a community based cross sectional study conducted to estimate the prevalence of preventable skin diseases and the distribution of its various associated risk factors among the households dwelling in the selected slums of Chennai. The study carries significance, as there is a large iceberg of unmet dermatological need in the community and many skin diseases are preventable. Most of the people with skin diseases can be managed and educated in the community itself (primary care) to prevent the further spread of these diseases.

The number of study participants involved was 107 households having 520 individuals. Among the study participants, 54.8% (285) were females and 45.2% (235) were males. The age of the study participants ranged from 7 months to 92 years with more number of study participants belonging to 20-29 years age group. Findings from NFHS 3 show that, the age structure of the population is younger in the slum area than the non-slum area in every city.[106]

Majority of the study participants were Hindus (76.3%). A large group of participants (37.3%) were not working. Socio economic status of the participants was classified based on modified B.G Prasad's Classification 2014. Based on the classification, a large proportion of households belonged to class IV status (34.6%) and 58% households resided in semi pucca houses.

7.1 Prevalence of preventable skin diseases:

The prevalence of preventable skin diseases was based on the diagnosis by clinical observations. Preventable skin diseases are those infectious skin diseases that can be avoided by improving the housing standards and hygiene practices, reducing overcrowding

and improving the socioeconomic status of the community. These diseases have the greatest importance in terms of public health according to WHO. In the present study, among the 107 households visited, 92 households (86%) had at least one person suffering from a preventable skin disease. In a household study by Abdel-Hafez et al among villages in Egypt, by personal interviews and examination at home, the prevalence was found to be 86.93%.[97]

In this study, the prevalence of preventable skin diseases among individuals was 46.3% (241 participants) with 53 participants having more than one skin disease in them. This is almost similar to the pilot study's prevalence of 42.7% done before the conduct of the present study.

The overall prevalence of skin diseases in population based studies conducted all over the world varied from 14 % to 50 %. [22,23,25,26,32] The present study's finding of 46.3% fell within this range. The variation is mainly due to differences in methodology, diagnostic criteria and definitions used to measure the disease and selection of study area.

Grills N, et al reported a similar prevalence of 45.3% in his study conducted among household members in the villages in northern India in 2011 based on interview and clinical examination.[107] A study in a village in Kerala showed 11.6% had skin diseases.[38] A population study in Mexico in 1990 among households showed the overall prevalence rate was 50%[48]

In rural Tanzania, a door-to-door household survey showed the prevalence of skin diseases of 34.7% with children being the most common group affected.[25] A study conducted by Sadia Jabeen et al in Abbottabad showed the prevalence of skin diseases was

23%.[84] Many Indian studies done before 2000 showed the prevalence of skin diseases between 3.9 to 33.84%.[42,43]

The difference in prevalence estimates between these studies and the present study could be due to various reasons like;

1. The differing survey methods, particularly the definitions of skin diseases, are a serious problem, preventing the valid comparison of such studies. All the skin diseases included in the present study were the diseases which can be preventable by improving the housing and hygiene practices, reducing overcrowding and by improving the socioeconomic status of them. Also, the classification of skin diseases differs; some disorders included herein had not been included in other comparable studies. It seems possible that variations in the sample size are of great importance.
2. Most of the earlier studies done in the community had used interviews and questionnaires as their tools of data collection. Very few studies have examined the participants for skin diseases.
3. Varied age groups recruited by different studies.
4. Rural-urban differences also play a major role because of the different rates of exposure to the risk factors.
5. There are no recent studies on preventable skin diseases among households in South India to compare the prevalence estimates of the present study.

The prevalence of preventable skin diseases in the present study could be due to rapid urbanization, overcrowding, low socio-economic status, humid climates and poor hygiene standards, which are the important contributory factors for preventable skin diseases.

The most common skin diseases in the study population were the parasitic infestation (122 participants) followed by fungal infection (119 participants). This finding is similar to the studies on various slums in India, which also showed that infestations and infections were more common.[42,97,108] Pediculosis capitis was the most common skin disease in the present study. This finding was consistent with the community-based study in rural Assiut, which also had pediculosis capitis as the most common infestation.[97] This finding could be due to overcrowding and unhygienic living conditions of the people residing in slums.

7.2 Prevalence of risk factors:

The current study showed the average household size of 4.86 persons. In Munkhurd slums, the average household size was 5.4 persons.[109] According to NFHS 3, the average household size in Chennai was 3.8 with 70% of the households as nuclear households.[106]The household size in the present study could be due to the growing urban population.

In the current study, the average number of living rooms per household was 1.28. This is similar to the NFHS 3 report that showed that Chennai had the smallest average number of rooms per household (less than 1.5). NFHS 3 data showed that the average number of person per room used for sleeping in Chennai was 1.8.[106] This finding was greater than the present study that had an average of 1.2. This may be due to the various programmes by the Government to improve the living conditions of the urban slum dwellers.

The current study showed that a large proportion (58%) lived in semi pucca houses and a very few (15%) lived in katcha houses. A study in Mankhurd slum in 2009 showed that 91.1% households resided in katcha houses, 4.8% households in semi pucca houses and

4.1% in pucca house.[109] NFHS 3 showed the percentage of household with katcha or semi pucca house in Chennai slum was 16.1%. The decrease in katcha houses and increase in semi pucca and pucca houses in the current study may be due to the initiatives taken by the Government for slum clearance.

The water obtained for all activities other than drinking in the present study was Corporation water. The present study showed that 92% households depend on common hand pumps and 8% households depend on bore wells as their main source of water. The study in Mankhurd slum showed that the source of water was public tap in 96.1% households, water tanker in 2.9 households and tap within residence in 1% households.[109] These findings are similar to the current study.

A study in Abbottabad showed that 63% depend on tap water and 37% depend on bore wells. [84] A study in Abbottabad showed that almost all people are happy that the water sources fulfill their needs,[84] which is consistent with the current study that 97% households had sufficient water. This may be due to the efforts taken to improve the living conditions of the slums.

The WASH household survey at Gaza by UNICEF and PHG showed 44 % of people showered every day with 45 % of all respondents washing their hands before cooking and 65 % washing their hands before eating. In the current study, 58.3% of the respondents took bath everyday and 31.8% washed their hands before cooking and 35.4 % washed their hands before eating. This shows the quality of living among the study population and their reduced awareness on the need for hand washing.[85]

7.3 Preventable skin diseases and socio-demographic variables:

7.3.1 Age and preventable skin diseases:

In the current study the prevalence of preventable skin diseases was statistically significant among children and adolescents, (p=0.006) with increased prevalence in 0 to 15 years age group (p<0.001). This finding is consistent with community-based household survey among villages in Egypt reporting a p value of <0.0001.[97] Most of the studies on skin diseases show that skin diseases were more common in children and adolescents.[40,43,110] The high prevalence among children and adolescents in the present study could be due to more interpersonal contact with others and increased exposure to unhygienic conditions, poor nutritional status and over-crowding.

7.3.2 Sex and preventable skin diseases:

The present study found a significant higher prevalence of preventable skin diseases among females than males (55.1% Vs 35.7%, p value<0.001). A study by Abdel-Hafez et al in Egypt,[97] Memon et al in Hyderabad,[110] Baijayanti Baur et al in Kolkata[34] and Kuruvilla M et al in Bantwal Taluq[43] also found the similar findings. High prevalence among females could be due to less awareness among them about skin problems and they may overlook such skin problems thinking that they do not need medical attention.

7.3.3 Socioeconomic status and preventable skin diseases

Lower the socio economic status higher the prevalence of preventable skin diseases was the observation made in the present study with a significant p value of 0.041. The lowest social class (Class V) had a prevalence of 56.9%. Factors like poor hygiene practices, low awareness, poorly ventilated housing, overcrowding etc., could make the lower socio economic class people more vulnerable to the disease. Abdel-Hafez et al[97] also showed statistical significance (p value = 0.001), as the prevalence of skin diseases

decreased with upgrading of social class. Studies by Baijayanti Baur et al in Kolkata, Menon et al in Hyderabad and Gibbs et al in Tanzania have also shown the similar findings.[26,34,110]

7.4 Preventable skin diseases and risk factors

Significant association was seen with type of house, overcrowding, place of bathing, frequency of taking bath, general appearance score and application of oil to body and preventable skin diseases.

7.4.1 Overcrowding and preventable skin diseases:

In the current study, 89.7% of the overcrowded households had preventable skin diseases. This association was found to be statistically significant (p value <0.001). Baijayanti Baur et al in Kolkata, showed a statistically significant association between overcrowding and transmissible skin diseases (p value=0.01).[34] A study by Gibbs et al in rural Africa[26] has also shown that overcrowding was significantly associated with transmissible skin diseases.

7.4.2 Type of house and preventable skin diseases

People living in katcha houses (64.4%) had more preventable skin diseases than people living in semi pucca (43.8%) and pucca (42.8%) houses. This association is found to be statistically significant. (p value = 0.004). This finding is similar to the study done among children in Pulianthope by Janaki et al. [47] This could be due to poor maintainence of the katcha house, humidity, overcrowding and poor hygiene of the participants residing in katcha houses.

7.4.3 General appearance score and preventable skin diseases:

General appearance score is the score to measure the level of the personal hygiene of the participants. Participants with poor general appearance score had significantly more

preventable skin diseases (70.6%) compared to those with fair (58.6%) and good general appearance scores (36.7%). ($p<0.001$) This finding is similar to the study in Hyderabad where those who maintained their personal hygiene had less infectious skin diseases (42.2%) compared to those who did not maintain their personal hygiene (57.8%). This association was statistically significant ($p=0.001$).[110] Participants with poor personal hygiene practices could have less awareness and poor hygienic practices leading to more infectious skin diseases in them.

7.4.4 Sharing things and preventable skin diseases:

In the present study, skin diseases were more common among people who share their belongings with others. But this was not found to be statistically significant. A study by Onwuliri, E.A et al showed that Pupils of the same family were having the highest frequency of skin diseases. According to them, most of them shared common facilities like clothes, towels, bed space, bathroom and combs. Sharing of towels at home was significantly associated with skin disorders among school children showing the importance of personal hygiene.[111]

7.4.5 Bathing frequency and preventable skin diseases:

The current study showed that infrequent bathing was statistically associated with high prevalence of preventable skin diseases. ($p=0.001$). Studies by Janaki M et al, Amin TT et al have also shown similar statistical association.[47,112] This could be due to the presence of microorganisms and poor condition of the skin in those who do not take bath daily.

7.4.5 Bathing place and preventable skin diseases:

The prevalence of preventable skin diseases in the present study may be due to the communal water source, which may be a source for spread of skin infections from one person to another.

7.4.6 Wearing washed clothes daily and preventable skin diseases:

In the present study, skin diseases were more among people who do not wear washed clothes daily. Studies on children by Janaki M et al, Amin TT et al have found statistical association between skin diseases and not wearing washed clothes daily. This could be due to presence of more microorganisms and poor hygienic conditions among those who do not wear washed clothes daily. [47,112]

7.4.7 Sleeping in the same room and scabies.

In the present study, scabies was more common among people who sleep in the same room (3.2%) than among people who do not sleep in the same room (1.2%). In an epidemiologic household study in a semi urban area of Goa, overcrowding for sleeping space was found to be significantly associated with scabies.[58] Many studies have shown that scabies is significantly associated with sharing the sleeping place. This could be due to easy spread of infection when there is overcrowding.

The current study shows a high prevalence of preventable skin diseases among children and adolescents and among females. The prevalence of hygiene related risk factors are also very high among the study population which may lead to worsening of the living conditions in later life.

Summary and Conclusion

8. SUMMARY AND CONCLUSION

A population based cross sectional study was done to find out the prevalence of preventable skin diseases and its risk factors among 520 participants residing in 107 households in selected urban slums of Chennai.

A semi structured pretested questionnaire was used to collect information regarding the socio-demographic details, risk factor exposure and symptoms of skin diseases. Head to foot examination was done to assess their general appearance for their personal hygiene habits and to check for diseases of skin, hair and nails. Those with skin diseases that could be prevented by improving their socioeconomic status and by proper sanitation and hygiene practices were considered as having preventable skin diseases.

The study revealed the following findings:

- The prevalence of preventable skin diseases among the study population was 46.3% (241 participants) and 86% of the households had at least one member suffering from preventable skin disease.
- Among the 241 participants with preventable skin diseases, 188 (78%) had only 1 disease in them, 40 (16.6%) had two skin diseases in them, 11 (4.6%) had 3 skin diseases in them and 2 (0.8%) had 4 skin diseases in them.
- Based on the etiological agent, the most common skin disease in the study population was the parasitic infestation (43.9%) followed by fungal infections (42.5%).
- Among those who had preventable skin diseases, 109 (35.4%) had pediculosis, 48 (15.5%) had tinea unguium, 46 (14.9%) had tinea corporis, 33 (10.7%) participants had impetigo, 18 (5.8%) had tinea cruris, 15 (4.9%) had tinea versicolor, 15 (4.9%)

had scabies, 6 (1.9%) had tinea barbae, 4 (1.3%) had tinea capitis, 4 (1.3%) had tinea pedis, 3 (1%) had furunculosis, 2 (0.6%) had leprosy, 2 (0.6%) participants had tinea faciei, 1 (0.3%) had carbunculosis, 1 (0.3%) had folliculitis, 1 (0.3%) had intertrigo and 1 participant (0.3%) had viral wart.

- Prevalence of Preventable skin diseases was significantly higher in children and adolescents and prevalence was significantly high in females than in males.
- Prevalence of preventable skin diseases showed significant inverse relationship with the socio economic status of the participants.
- The prevalence of modifiable environmental risk factors was high among the study population. 90.6% of the households shared their living rooms, 84% of the individuals share their sleeping place with others, 41.7% participants did not take bath daily, 65% participants shared their soap with others, 68.5% individuals shared their towel with their family members, 73.3% participants shared their comb with others and the hand washing practices of the individuals were very poor except for washing hands after using toilet in 80% participants.
- The general appearance score was good in 58% of the respondents. Many in the study population followed practices like changing and wearing washed clothes daily (66.3%), wearing undergarments (58.5%), bathing in bathrooms (67.9%) and wearing footwear while going outside (85.8%).
- A significant association was found between preventable skin diseases and type of house, overcrowding, frequency of taking bath, application of oil to body, place of taking bath and general appearance score.
- Statistically significant association was found between hair hygiene related risk factors and pediculosis, Facial hygiene related risk factors and Tinea barbae, Foot

hygiene related risk factors and Tinea pedis, hygiene score and impetigo, hand washing after coming from outside and impetigo and Type of house and impetigo.

- Logistic regression showed age groups, practice of not bathing regularly and practice of not applying oil to the body and poor general appearance score to be independent risk factors for controlling for other variables in the current study.

The study therefore highlights the high prevalence of hitherto undetected preventable skin diseases in the slums of Chennai and the importance of modifying their personal hygiene and environmental hygiene factors so as to enable individuals to attain their maximum healthy practices and to reduce the rate of preventable skin diseases.

Limitations

9. LIMITATION

1. The present study was done among households in urban slum area only, hence limits the generalizability of the findings to the non-slum areas and rural areas.
2. In the present study, only head to foot clinical examination of the individual for the diagnosis of lesions of skin and its appendages was the tool used to identify skin lesions. No laboratory investigation were undertaken due to impracticality and non feasibility. This may have lead to some misclassification of diseases.
3. Nutritional deficiency manifestations of skin and hair could not be assessed objectively.
4. It is also understood that hygiene practices vary day to day and hence, one-day measurement could have lead to bias.
5. Participants may feign to give the real picture of their hygiene practices, so as to maintain their level of dignity in the society. This may lead to a possibility of bias in this study.
6. The study carries the inherent limitations of cross sectional studies, thereby disabling the understanding of true temporal relationships between the risk factors and preventable skin diseases.

Recommendations

10. RECOMMENDATIONS

Based on the findings of the current study, the following recommendations are being put forward.

1. Preventable skin diseases, considered as poverty related diseases have been silently ravaging all ages and both sexes of the community with an alarming prevalence of 46.3% among individuals and 86% among households in the current study. This highlights the need for screening programmes for those dwelling in the slums for early diagnosis of skin diseases on account of the huge social and economic burden it places on the community and country and the adverse impact on the quality of lives of the affected individuals.
2. As preventable skin diseases have many risk factors, which are amenable to modification, emphasis must be laid on such factors like improving the hygiene practices in the slums.
3. Health education intervention is often recommended as a first option to create the enabling environment for other strategies to thrive. Sanitation and hygiene beliefs and practices should be assessed and community members should be involved in planning and implementing interventions.
4. Almost 40% of the individuals do not have good general appearance score. Measures should be taken to improve the score, by providing simple approaches of health education. Health education on improving the frequency of bathing, improving personal hygiene, changing the place of bathing should be insisted.
5. Large proportions of the study population affected by preventable skin diseases are the children, adolescents and young adults, and females. Hence, the impact of hygiene promotion and education by using participatory techniques should be

maximized, targeting women, children and adolescents, and using women as facilitators.

6. National and sub-national health programme priorities should take account of hygiene and sanitation-related disease burden and ensure that hygiene is fully integrated within disease specific and national health programmes.
7. Directions for future research.

   The present study being a cross sectional study is not able to assure causality association for the skin morbidity. Hence a prospective study on large scale may be undertaken to prove causal association.

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Annexures

ANNEXURE-1

INFORMATION SHEET

Skin diseases in developing countries have a serious impact on people's quality of life and bring out significant burden to the nation. They have high morbidity but apparently little mortality. The prevalence of skin diseases in any region or country depends on various factors, such as genetics, racial constitution, social and hygienic standards, customs and occupations.

In India there is a rapid spurt in the incidence and prevalence of transmissible skin diseases due to the epidemiologic transition fuelled by underdeveloped economy, social backwardness and globalization, which has led to rapid urbanization, major lifestyle changes, overcrowding & poor sanitation. Children, young adults as well as old persons are susceptible to skin infections.

There is a lack of personal hygiene and presence of unhygienic conditions, overcrowding, inadequate nutrition, hot and humid conditions, sharing of towels/combs among people in urban slums. These skin diseases which are often transmissible and contagious, are readily treatable. Studies in primary care settings in developing countries have found that treatment failure rates of more than 80 % are common in slums of developing countries.

Giving proper Health education and improving the personal hygiene of the slum population, will definitely help to reduce the prevalence of communicable skin diseases of households.

The tools used for this study includes questionnaire, head to foot examination of skin, including hair and nails and anthropometry.

- The privacy of the participants in the research will be maintained throughout the study. In the event of any publication or presentation resulting from the research, no personally identifiable information will be shared.

- Taking part in this study is voluntary. You and your son/daughter are free to decide whether to participate in this study or to withdraw at any time; your decision will not result in any loss of benefits to which you are otherwise entitled.

- The results of the special study may be intimated to you at the end of the study period or during the study if anything is found abnormal which may aid in the management or treatment.

Signature of investigator

Signature or Thumb impression of the participant/ participant's parent or Guardian

_____ _____

Date:

INFORMED CONSENT FORM

Title of the dissertation: "A STUDY ON PREVALENCE OF PREVENTABLE SKIN DISEASES AND THEIR RISK FACTORS AMONG HOUSEHOLDS IN SELECTED SLUMS OF CHENNAI, TAMIL NADU – 2014."

Name of the participant: Age/Sex:

Name of the participant's parents: Age/Sex:

(1) I have been explained in detail about the study and its procedure. I confirm that I had completely understood the study and have had the opportunity to ask questions

(2) I understand that my/ my son/daughter's participation in the study is voluntary and that I am/my son/daughter is free to withdraw at any time, without giving any reason, without their medical care or legal rights being affected.

(3) I understand that the principal investigator, others working on the investigator's behalf, the Ethics Committee and the regulatory authorities will not need my permission to look at my health records both in respect of the current study and any further research that may be conducted in relation to it, even if I withdraw from the trial. I agree to this access. However I understand that my or my son/daughter's identity will not be revealed in any information released to third parties or published.

(4) I agree not to restrict the use of any data or results that arise from this study provided such a use is only for scientific purpose(s).

(5) I agree to /to my son/daughter participating in the above study.

Signature of investigator

Signature or Thumb impression
of the participant/ participant's parent
or Guardian

_____ _____

Date:

தகவல் தாள்

சென்னையின் தேர்ந்தெடுக்கப்பட்ட நகர்ப்புற குடிசை வாழ் குடும்பங்களில் தடுக்கக்கூடிய தோல் நோய்கள் மற்றும் அதன் அபாய காரணிகளின் பாதிப்பு பற்றிய ஆய்வு - 2014

வளரும் நாடுகளில் தோல் வியாதிகள், மக்களின் வாழ்க்கைத் தரத்தின் மீது ஒரு தீவிர தாக்கத்தை உண்டு பண்ணுவதோடு தேசத்திற்கும் பெரும் சுமையை கொண்டு வருகிறது. தோல் வியாதிகளினால் இறப்பு விகிதம் அதிகம் ஏற்படாவிட்டாலும் சமுதாயத்தில் "நோயுற்ற நிலை" அதிகம் இருக்கும். ஒரு நாட்டில் ஒரு பகுதியில் காணப்படும் தோல் வியாதிகள் பல்வேறு காரணிகளைப் பொறுத்தது. மரபுச்சார்ந்த காரணிகளாகவோ, இனம் சார்ந்த காரணிகளாகவோ, சமூகத்தரம், சுகாதாரத்திரம், மற்றும் மக்களின் பழக்க வழக்கங்கள், செய்யும் வேலைகளைப் பொறுத்தாகவோ இருக்கும்.

இந்தியாவில் பொருளாதார வளர்ச்சியின்மை, சமுதாயத்தின் பின் தங்கிய நிலை, உலகமயமாக்கலால் வேகமாக ஏற்பட்ட நகர மயமாக்கல், வாழ்க்கை முறையில் ஏற்பட்ட பெரும் மாற்றங்கள், அதிகமான மக்கள் பெருக்கம், சுகாதாரமற்ற நிலை ஆகியவை தோல்வியாதிகள் திடீரென வேகமாக பரவக் காரணமாக அமைந்துள்ளன. சிறுவர்கள், வாலிபர்கள், முதியோர் யாவருக்கும் தோல் வியாதிகள் வேகமாக தொற்றிக் கொள்ள வாய்ப்பு உள்ளது.

தனிமனிதனின் சுகாதாரக் குறைவு, சுகாதாரமற்ற சூழ்நிலை, மக்கள் பெருக்கம், ஊட்டச்சத்து குறைபாடு, அதிக வெப்பம், ஈரத்தன்மை நிறைந்த சூழ்நிலை, சீப்புக்கள், துவட்டும் துண்டுகள் ஆகியவற்றை பகிர்ந்து கொள்ளுதல் ஆகிய பழக்கங்கள் நகர்ப்புற குடிசைவாழ் மக்களில் காணப்படுகின்றன. இந்த தோல் வியாதிகள் எளிதில் பரவக் கூடியவை. இத்தோல் வியாதிகளை எளிதில் சிகிச்சை செய்து குணப்படுத்த முடியும்.

குடிசைவாழ் மக்களிடம் சுகாதார கல்வி கொடுப்பது, தனிநபர் சுகாதார கல்வி கொடுப்பது, தனிநபர் சுகாதாரத்தை மேம்படுத்துவது, மூலம் வீடுகளில் விரைவில் பரவும் தொற்று நோய்கள் இருப்பதை நிச்சயமாக குறைக்க உதவும்.

இந்த ஆய்வு நடத்த நான் பயன்படுத்தும் கருவிகள்:

1) கேள்விபட்டியல்
2) தலைமுதல் பாதம் வரை உள்ள தோல், ரோமம், நகர் ஆகியவற்றை ஆய்வு செய்தல்.
3) உயரம், எடை கண்டறிதல்.

நீங்கள் இந்த ஆராய்ச்சியில் பங்கேற்று இதில் கேட்கப்படும் கேள்விகளுக்கு பதில் அளிக்க விரும்புகிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளை அல்லது கருத்துக்களை வெளியிடும்போதோ அல்லது ஆராய்ச்சியின் போதோ தங்களது பெயரையோ, அடையாளங்களையோ வெளியிடமாட்டோம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியில் பங்கேற்பது தங்களுடைய விருப்பத்தின்பேரில்தான் இருக்கிறது. மேலுமு அவர்கள் எந்நேரமும் இந்த ஆராய்ச்சியிலிருந்து பின்வாங்கலாம் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

இந்த ஆராய்ச்சியின் முடிவுகளை ஆராய்ச்சியின் போது அல்லது ஆராய்ச்சியின் முடிவின்போது தங்களுக்கு அறிவிக்கப்படும் என்பதையும் தெரிவித்துக் கொள்கிறோம்.

ஒப்புதல் படிவம்

சென்னையின் தேர்ந்தெடுக்கப்பட்ட நகர்ப்புற குடிசை வாழ் குடும்பங்களில் தடுக்கக்கூடிய தோல் நோய்கள் மற்றும் அதன் அபாய காரணிகளின் பாதிப்பு பற்றிய ஆய்வு - 2014

பங்கேற்பாளர்/பங்கேற்பாளரின் பெற்றோரின் பெயர் : வயது :

ஆராய்ச்சி சேர்க்கை எண் :

இந்த ஆராய்ச்சியின் விவரங்களைக் கொண்ட தகவல் தாளைப் பெற்றுக்கொண்டேன்.

இந்த ஆராய்ச்சியின் விவரங்களும் அதன் நோக்கமும் முழுமையாக எனக்கு தெளிவாக விளக்கப்பட்டது.

எனக்கு விளக்கப்பட்ட விஷயங்களை நான் புரிந்துகொண்டு எனது சம்மதத்தை தெரிவிக்கிறேன்.

இந்த ஆராய்ச்சியில் பிறரின் நிர்ப்பந்தமின்றி என் சொந்த விருப்பத்தின் பேரில் தான் பங்கு பெறுகின்றேன். இந்த ஆராய்ச்சியில் இருந்து நான்/எனது குழந்தை எந்நேரமும் பின் வாங்கலாம் என்பதையும் அதனால் எந்த பாதிப்பும் ஏற்படாது என்பதையும் நான் புரிந்துக் கொண்டேன்.

நான் என்னுடைய சுய நினைவுடனும் மற்றும் முழு சுதந்திரத்துடனும் இந்த மருத்துவ ஆராய்ச்சியில் என்னை/எனது குழந்தையை சேர்த்துக் கொள்ள சம்மதிக்கிறேன்.

ஆராய்ச்சியாளர் மற்றும் அவரைச் சார்ந்தவர்களோ, நெறிமுறைக்குழு உறுப்பினர்களோ நான்/எனது குழந்தை இந்த ஆராய்ச்சியில் இருந்து விலகினாலும் என்னுடைய அனுமதியின்றி எனது உடல்நிலை குறித்த தகவல்களை இந்த ஆராய்ச்சிக்கோ இது தொடர்பான வேறு ஆராய்ச்சிகளுக்கோ பயன்படுத்திக்கொள்ள முடியும் என்று புரிந்து கொண்டு சம்மதம் அளிக்கிறேன். ஆனாலும் என்னுடைய அடையாளம் வெளியிடப்படமாட்டாது என்று புரிந்துகொள்கிறேன்.

இந்த ஆராய்ச்சியின் தகவல்களையும் முடிவுகளையும் அறிவியல் நோக்கத்திற்காக பயன்படுத்துவதற்கு நான்/எனது குழந்தையை அனுமதிக்கிறேன். நான்/எனது குழந்தை ஆராய்ச்சியில் பங்குபெற சம்மதிக்கிறேன்.

பங்கேற்பாளர் பெயர்

பங்கேற்பவரின்/பங்கேற்பவரின் பெற்றோர்
கையொப்பம் (அல்லது) கட்டைவிரல் ரேகை

ஆய்வாளர் பெயர்

ஆய்வாளரின் கையொப்பம்

இடம் :

தேதி :

ANNEXURE-2

A STUDY ON PREVALENCE OF PREVENTABLE SKIN DISEASES AND THEIR RISK FACTORS AMONG HOUSEHOLDS IN URBAN SLUMS OF CHENNAI, TAMIL NADU – 2014

S.No: _____ Date: _____

Household No: _____ Cluster No: _____

A) SOCIO DEMOGRAPHIC DETAILS:

1. Name :

2. Age : _____ years

3. Sex : ☐ 1) Male ☐ 2) Female

4. Religion : ☐ 1) Hindu ☐ 2) Muslim ☐ 3) Christian ☐ 4) Others

5. Address : Door No:..... Street:.....

Area Name: .....….....

Zone: .....Division: .....

6. Educational status of the participant: ☐ 1) Illiterate ☐ 2) I-V ☐ 3) VI-X
☐ 4) XI-XII ☐ 5) Diploma ☐ 6) Degree
☐ 7) PG Degree ☐ 8)Others ☐ 9) Not yet gone to school

7. Occupation of the participant: ☐ 1) Not working ☐ 2) Unskilled
☐ 3) Semi skilled ☐ 4) Skilled
☐ 5) Self-employed ☐ 6) Student
☐ 7) Semi professional ☐ 8) Professional

8. Total monthly income of the Family: _____

9. Total Number of Family Members: _____

10. Per Capita Income/Month: _____

11. Type of House: ☐ 1) Kutcha ☐ 2) Semipucca ☐ 3) Pucca ☐ 4) Others

12. Number of rooms: ☐ 1) 1 ☐ 2) 2 ☐ 3) 3 ☐ 4) 4 or more

13. Do you all sleep in the same room? ☐ 1) Yes ☐ 2) No

B) HYGIENE PRACTICE:

14. What is the main source of water for washing, bathing and other domestic purposes?
☐ 1) Corporation water ☐ 2) Lorry water ☐ 3) Bore well
☐ 4) Hand pump ☐ 5) Well ☐ 6) Water collections ☐ 7) Others

15. Is the water available for domestic needs enough to fulfill your needs?
☐ 1) Yes ☐ 2) No

16. Where do you/your child bathe?
☐ 1) Bathroom ☐ 2) Near wells ☐ 3) Near pump ☐ 4) Natural Water collections

17. How often do you/ your child bathe?
☐ 1) Every day ☐ 2) alternate days ☐ 3) Weekly thrice
☐ 4) Weekly twice ☐ 5) Weekly once

18. Do you/ your child use soap for bathing? ☐ 1) Yes ☐ 2) No

19. How often do you/ your child wash your hair?
☐ 1) Every day ☐ 2) alternate days
☐ 3) Weekly thrice ☐ 4) Weekly twice ☐ 5) Weekly once

20. Do you/ your child wash your hands with soap during the following activities? (Multiple answers) (1-yes, 2-no, 3- not applicable)

☐ 1) After playing	☐ 1) Yes	☐ 2) No	☐ 3) Not applicable
☐ 2) After coming from outside work	☐ 1) Yes	☐ 2) No	
☐ 3) Before meal times	☐ 1) Yes	☐ 2) No	
☐ 4) After meal times	☐ 1) Yes	☐ 2) No	
☐ 5) Before cooking	☐ 1) Yes	☐ 2) No	☐ 3) Not applicable
☐ 6) After cooking	☐ 1) Yes	☐ 2) No	☐ 3) Not applicable
☐ 7) After going to toilet	☐ 1) Yes	☐ 2) No	

21. Do you/ your child apply oil to your body? ☐ 1) Yes ☐ 2) No

22. Do you/ your child apply oil to your hair? ☐ 1) Yes ☐ 2) No

23. Where do you shave? ☐ 1) Home ☐ 2) Barber shop
☐ 3) Not applicable ☐ 4) Both

24. Do you wear washed clothes daily? ☐ 1) Yes ☐ 2) No

25. What personal belongings do you your child share with others?

a) Comb	☐ 1) Yes	☐ 2) No	
b) Towel	☐ 1) Yes	☐ 2) No	
c) Razor Blade	☐ 1) Yes	☐ 2) No	☐ 3) Not applicable
d) Soap	☐ 1) Yes	☐ 2) No	
e) Dresses	☐ 1) Yes	☐ 2) No	

26. Do you wear undergarments? ☐ 1) Yes ☐ 2) No

27. Do you/ your child always wear footwear while going out? ☐ 1) Yes ☐ 2) No
If yes, ☐ 1) Open shoes ☐ 2) close shoes

28. Do you/ your child cut your nails atleast once a week? ☐ 1) Yes ☐ 2) No

29. What domestic animal do you have in your home?
☐ 1) Nil ☐ 2) Cow ☐ 3) Goat ☐ 4) Poultry ☐ 5) Dog ☐ 6) Cat ☐ 7) Others

C) MEDICAL HISTORY:

30. Do you have Diabetes mellitus? ☐ 1) Yes ☐ 2) No

D) HISTORY RELATED TO SKIN DISEASES:

31. Do you/ your child have any complaints related to skin disease? ☐ 1) Yes ☐ 2) No
If yes, what complaint? _____

32. Are your family members having any skin disease?
☐ 1) Yes ☐ 2) No ☐ 3) Don't Know

33. Do you/ your child have itching? ☐ 1) Yes ☐ 2) No
If yes, where? _____
Is it aggravated at night? ☐ 1) Yes ☐ 2) No
Are your family members also suffering from itching? ☐ 1) Yes ☐ 2) No

34. Are you/ your child taking any medicines for any illness? ☐ 1) Yes ☐ 2) No

E) EXAMINATION:

APPEARANCE – Personal Hygiene

		0	**1**
1.	Dress	☐1) Improper	☐2) Proper
		☐ 1)Unclean	☐ 2) Clean
2.	Skin	☐ 1)Diseased	☐ 2) Non diseased
3.	Hair / Scalp	☐ 1)Unclean	☐ 2) Clean
		☐ 1)with Louse	☐ 2) Without louse
		☐ 1)Uncombed	☐ 2) Combed
4.	Ear	☐ 1)Unclean	☐ 2) Clean
5.	Eyes	☐ 1)Unclean	☐ 2) Clean
6.	Nose	☐ 1)Unclean	☐ 2) Clean
7.	Face	☐ 1)Unclean	☐ 2) Clean
8.	Teeth	☐ 1)Unbrushed	☐ 2) Brushed
		☐ 1)Diseased	☐ 2) Undiseased
9.	Nails	☐ 1)Unclean	☐ 2) Clean

(<=6 poor, 7-10 Fair, >10 Good)

COLOUR OF SKIN:

Colour of the skin: ☐ 1) Ivory ☐ 2) Beige ☐ 3) Light brown
☐ 4) Medium brown ☐ 5) Dark brown ☐ 6) Very dark brown

SKIN DISEASES: ☐ 1) Yes ☐ 2) No

☐ (1) Impetigo	☐ (10) Tinea barbae
☐ (2) Intertrigo	☐ (11) Scabies
☐ (3) Carbuncle	☐ (12) Tinea pedis
☐ (4) Warts	☐ (13) Tinea cruris
☐ (5) Ecthyma	☐ (14) Tinea carporis
☐ (6) Furuncles	☐ (15) Tinea capitis
☐ (7) Folliculitis	☐ (16) Onychomycosis
☐ (8) Leprosy	☐ (17) Molluscum contagiosum
☐ (9) Pediculosis	☐ (18) Pitryasis Versicolor

சென்னையின் தேர்ந்தெடுக்கப்பட்ட நகர்ப்புற குடிசை வாழ் குடும்பங்களில் தடுக்கக்கூடிய தோல் நோய்கள் மற்றும் அதன் அபாய காரணிகளின் பாதிப்பு பற்றிய ஆய்வு - 2014

எண் : _____ தேதி : _____

குடும்ப எண் : _____

அ) <u>சமூக நிலை</u>:

1 . பெயர் :

2 . வயது : _____ ஆண்டுகள்

3 . பாலினம் : ☐1)ஆண் ☐2)பெண்

4 . மதம் : ☐1)இந்து ☐2) முகமதியர் ☐3) கிறித்துவர் ☐4)மற்றவை

5 . முகவரி : கதவு எண் : ..... தெரு : ....
பகுதி பெயர் : ....
மண்டலம் : ..... பிரிவு: ....

6. பங்கேற்பாளரின் கல்வித்தகுதி: ☐1) படிக்கவில்லை ☐2) 1-5 வகுப்பு ☐3) 6 –10 வகுப்பு
☐4) 11 –12 வகுப்பு ☐5) பட்டயப்படிப்பு ☐6) பட்டப்படிப்பு
☐7) பட்டமேற்படிப்பு ☐8) மற்றவை

7. பங்கேற்பாளரின் வேலை : _____

8. குடும்பத்தின் மொத்த மாத வருமானம் : _____

9. குடும்பத்தில் மொத்த உறுப்பினர்களின் எண்ணிக்கை : _____

10 . தனிநபர் மாத வருமானம் : _____

11 . வீட்டின் வகை : _____

12 . அறைகள் எண்ணிக்கை : ☐1) 1 ☐2) 2 ☐3) 3 ☐4) 4 அல்லது அதற்கு மேல்

13 . நீங்கள் அனைவரும் ஒரே அறையில் தூங்குகிறீர்களா? ☐1) ஆம் ☐2) இல்லை

<u>பி) சுகாதர பயிற்சி விவரம்:</u>

14. சலவை , குளியல் மற்றும் பிற வீட்டு தேவைகளுக்கு முக்கிய நீர் ஆதாரம் என்ன?
☐1) மாநகராட்சி நீர் ☐2) லாரி தண்ணீர் ☐3) ஆழ்குழாய் கிணற்று நீர்
☐4) கை பம்பு ☐5) கிணறு ☐6) இயற்கை நீர் தேக்கங்கள் ☐7) மற்றவை

15. உங்களுக்கு கிடைக்கும் தண்ணீர் உங்கள் வீட்டின் தேவைகளை பூர்த்தி செய்ய போதுமானதாக உள்ளதா? ☐1) ஆம் ☐2) இல்லை

16. நீங்கள் எங்கே குளிக்கிறீர்கள்?
☐1) குளியலறை ☐2) கிணற்று அருகில் ☐3) குழாய் அருகே
☐4) இயற்கை நீர் தேக்கங்களில்

17. நீங்கள் எத்தனை நாளைக்கு ஒருமுறை குளிக்கிறீர்கள்?
☐1) தினமும் ☐2) ஒரு நாள் விட்டு ஒரு நாள் ☐3) வாரம் மூன்று முறை
☐4) வாரம் இருமுறை ☐5) வாரம் ஒரு முறை

18. நீங்கள் குளிக்க சோப்பு பயன்படுத்துகிறீர்களா? ☐1) ஆம் ☐2) இல்லை

19. நீங்கள் எத்தனை நாளைக்கு ஒருமுறை தலைக்கு குளிக்கிறீர்கள்?
☐1) தினமும் ☐2) வாரத்தில் 4 அல்லது அதற்கு மேல்
☐3) வாரம் மூன்று முறை ☐4) வாரம் இருமுறை ☐5) வாரம் ஒரு முறை

20. நீங்கள் பின்வரும் செயல்கள் செய்யும் போது சோப்பு கொண்டு உங்கள் கைகளை கழுவுகிறீர்களா? (பல விடைகள்)

☐1) விளையாட்டுக்கு பிறகு	☐1) ஆம் ☐2) இல்லை ☐3) பொருந்தாது
☐2) வேலைக்கு பிறகு	☐1) ஆம் ☐2) இல்லை
☐3) சாப்பாட்டுக்கு முன்	☐1) ஆம் ☐2) இல்லை
☐4) சாப்பாட்டுக்கு பின்	☐1) ஆம் ☐2) இல்லை
☐5) சமையல் செய்வதற்கு முன்	☐1) ஆம் ☐2) இல்லை ☐3) பொருந்தாது
☐6) சமையல் செய்த பின்	☐1) ஆம் ☐2) இல்லை ☐3) பொருந்தாது
☐7) கழிவறைக்கு சென்ற பின்	☐1) ஆம் ☐2) இல்லை

21. நீங்கள் உங்கள் உடலுக்கு எண்ணெய் தடவுகிறீர்களா? ☐1) ஆம் ☐2) இல்லை

22. நீங்கள் உங்கள் முடிக்கு எண்ணெய் தடவுகிறீர்களா? ☐1) ஆம் ☐2) இல்லை

23. நீங்கள் எங்கே சவரம் செய்து கொள்கிறீர்கள்?
☐1) வீட்டில் ☐2) முடி திருத்த கடையில் ☐3) பொருந்தாது ☐4) இரு இடங்களில்

24. நீங்கள் தினமும் துவைத்த துணிகளை அணிகிறீர்களா? ☐1) ஆம் ☐2) இல்லை

25. நீங்கள் மற்றவர்களுடன் எந்த தனிப்பட்ட உடமைகளை பகிர்ந்து கொள்கிறீர்கள்?

அ) சீப்பு	-	☐1) ஆம் ☐2) இல்லை
ஆ) துண்டு	-	☐1) ஆம் ☐2) இல்லை
இ) சவரம் பிளேடு	-	☐1) ஆம் ☐2) இல்லை ☐3) பொருந்தாது
ஈ) சோப்பு	-	☐1) ஆம் ☐2) இல்லை
உ) ஆடைகள்	-	☐1) ஆம் ☐2) இல்லை

26. நீங்கள் உள்ளாடைகள் பயன்படுத்துகிறீர்களா? : ☐1) ஆம் ☐2) இல்லை

27. வெளியே செல்லும் போது நீங்கள் எப்போதும் காலணி அணிகிறீர்களா?
☐1) ஆம் ☐2) இல்லை
ஆம் என்றால், ☐1) திறந்த காலணிகள் ☐2) மூடிய காலணிகள்

28. நீங்கள் குறைந்தது வாரம் ஒரு முறையாவது உங்கள் நகங்களை வெட்டுவீர்களா? :
☐1) ஆம் ☐2) இல்லை

29. உங்கள் வீட்டில் என்ன வளர்ப்புப்பிராணிs உள்ளது?

☐1) எதுவும் இல்லை ☐2) பசு ☐3) ஆடு ☐4) கோழி ☐5) நாய் ☐6) பூனை ☐7) மற்றவை

இ) மருத்துவ வரலாறு :sdfsdfdsf

30. **உங்களுக்கு நீரிழிவு நோய் இருக்கிறதா**? ☐1) **ஆம்** ☐2) **இல்லை**

ஈ) தோல் நோய்கள் தொடர்பான வரலாறு :

31. **உங்களுக்கு ஏதேனும் தோல் நோய் இருக்கிறதா**? ☐1) **ஆம்** ☐2) **இல்லை**
ஆம் எனில் , என்ன அறிகுறி ? _____

32. **உங்கள் குடும்ப உறுப்பினர்களுக்கு ஏதேனும் தோல் நோய் இருக்கிறதா**?
☐1) **ஆம்** ☐2) **இல்லை** ☐3) **தெரியாது**

33. **உங்களுக்கு அரிப்பு இருக்கிறதா**? ☐1) **ஆம்** ☐2) **இல்லை**
ஆம் எனில், எங்கே ? _____
அது இரவில் அதிகமாகிறதா ? ☐1) **ஆம்** ☐2) **இல்லை**

உங்கள் குடும்ப உறுப்பினர்களும் அரிப்பு ஊரலால் பாதிக்கப்பட்டுள்ளனரா? ☐1) **ஆம்** ☐2) **இல்லை**

34. **நீங்கள் ஏதேனும் சுகவீனத்திற்கு மருந்து எடுக்கொண்டு இருக்கிறீர்களா**? ☐1) **ஆம்** ☐2) **இல்லை**

உ) தோற்றம் - தனிப்பட்ட சுகாதாரம்

		0	1
1.	ஆடை	☐1) ஒழுங்கின்மை	☐2) ஒழுக்கம்
		☐1) அசுத்தமானது	☐2) சுத்தமானது
2.	தோல்	☐1) நோயுற்றது	☐2) நோய்யற்றது
3.	முடி/உச்சந்தலை	☐1) அசுத்தமானது	☐2) சுத்தமானது
		☐1) பேன் உள்ளது	☐2) பேன் இல்லை
		☐1) கலைந்தது	☐2) கோதியது
4.	காது	☐1) அசுத்தமானது	☐2) சுத்தமானது
5.	கண்	☐1) அசுத்தமானது	☐2) சுத்தமானது
6.	மூக்கு	☐1) அசுத்தமானது	☐2) சுத்தமானது
7.	முகம்	☐1) அசுத்தமானது	☐2) சுத்தமானது
8.	பல்	☐1) துலக்காதது	☐2) துலக்கியது
		☐1) நோயுற்றது	☐2) நோய்யற்றது
9.	நகங்கள்	☐1) அசுத்தமானது	☐2) சுத்தமானது

COLOUR OF SKIN:

Colour of the skin: ☐ 1) Ivory ☐ 2) Beige ☐ 3) Light brown
☐ 4) Medium brown ☐ 5) Dark brown ☐ 6) Very dark brown

SKIN DISEASES: ☐ 1) Yes ☐ 2) No

☐ (1) Impetigo	☐ (10) Tinea barbae
☐ (2) Intertrigo	☐ (11) Scabies
☐ (3) Carbuncle	☐ (12) Tinea pedis
☐ (4) Warts	☐ (13) Tinea cruris
☐ (5) Ecthyma	☐ (14) Tinea carporis
☐ (6) Furuncles	☐ (15) Tinea capitis
☐ (7) Folliculitis	☐ (16) Onychomycosis
☐ (8) Leprosy	☐ (17) Molluscum contagiosum
☐ (9) Pediculosis	☐ (18) Pitryasis Versicolor

ANNEXURE - 3

SOCIO ECONOMIC CLASS BASED ON MODIFIED B.G.PRASAD'S CLASSIFICATION

The study was done in urban area and modified B.G. Prasad's classification was used for socio economic classification, based on the per capita monthly income of the family.

The calculation was done as follows:

Centre wise Consumer Price Index for Chennai for the month of April 2014 = 223

Multiplying factor =

Current index value (223) / Base index value in 2001 (100) = 2.23.

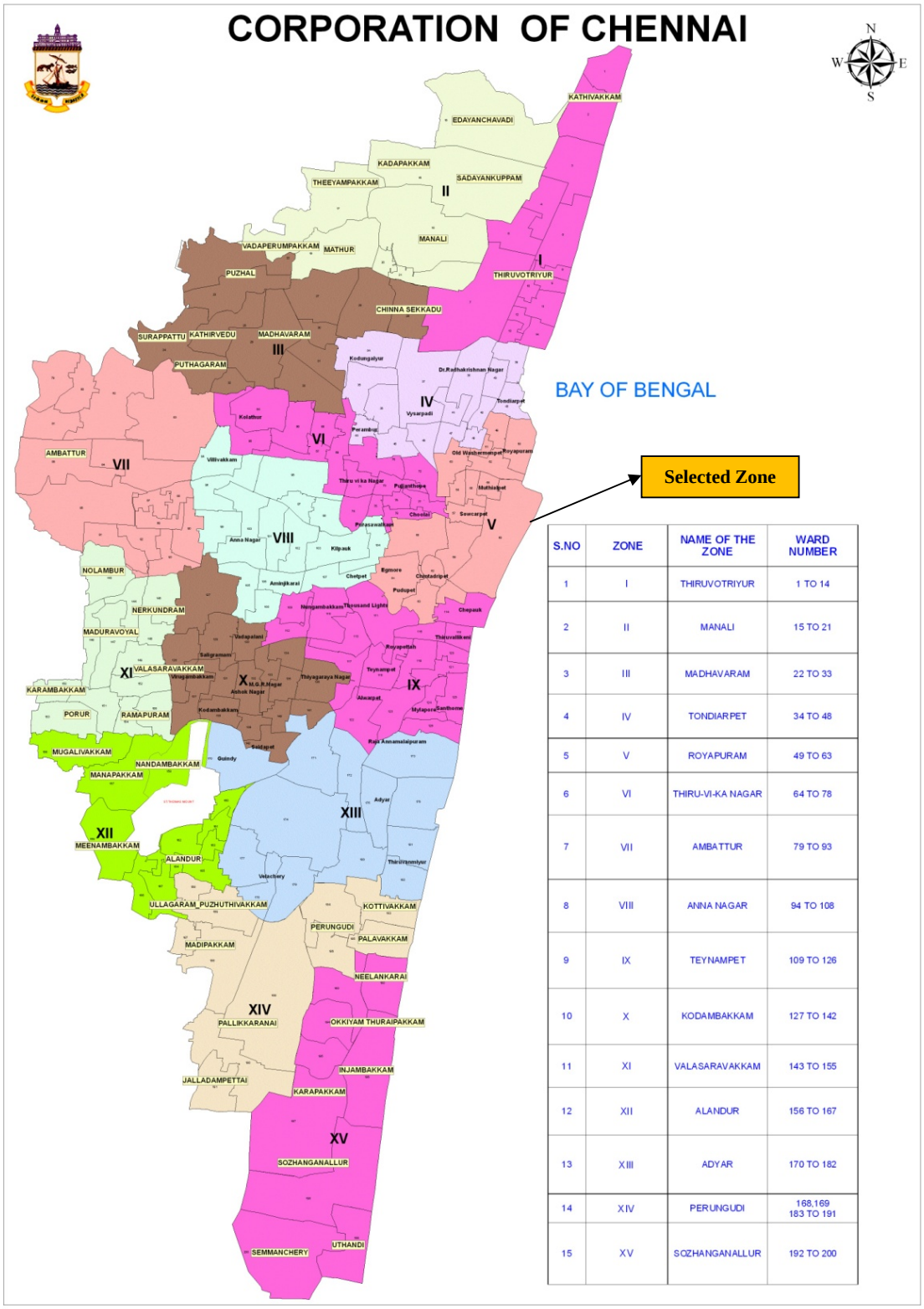
Modified BG Prasad's classification for April 2014 -

New income value = 2.23 × (old value × 4.63 × 4.93)

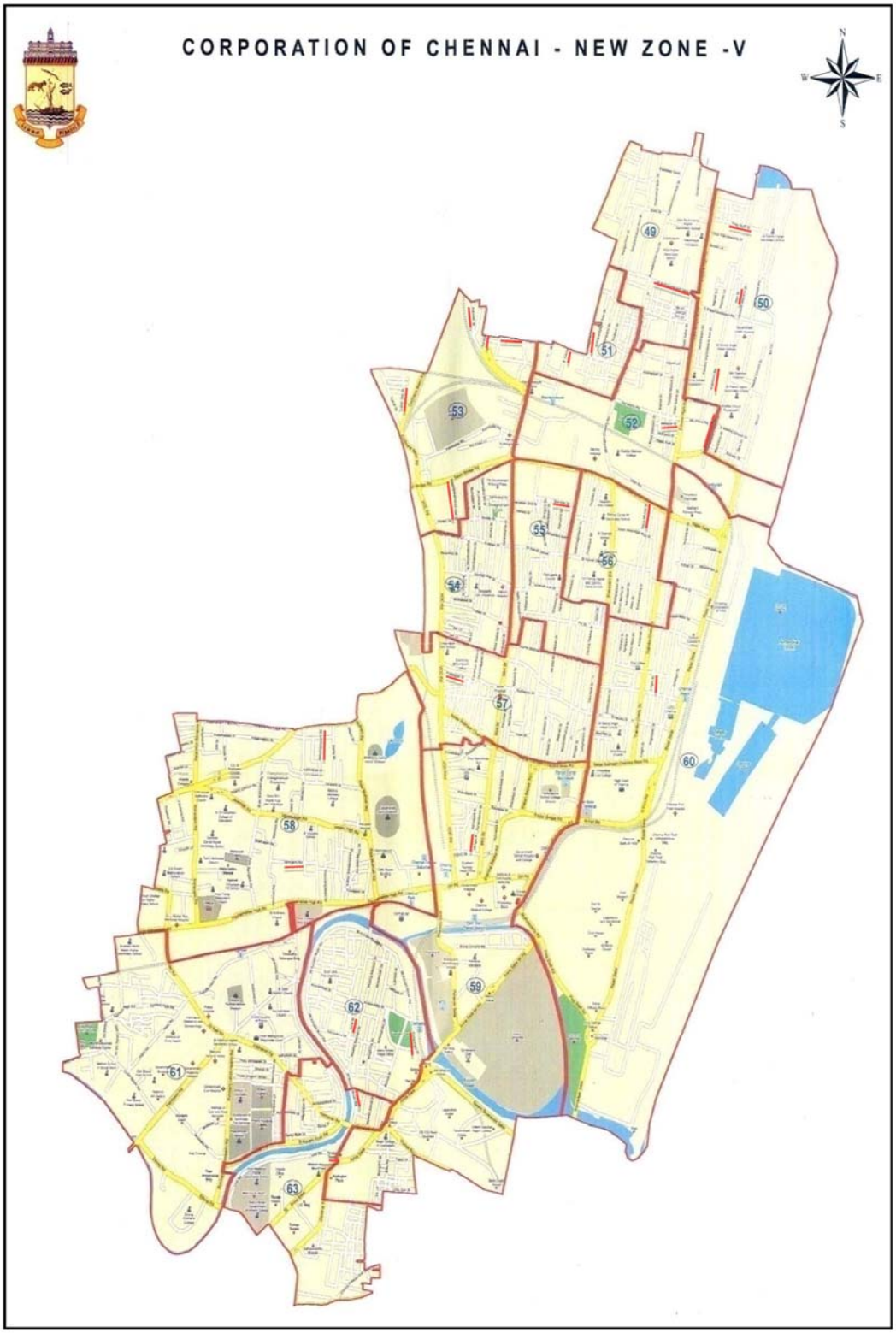
[Correction Factor (CF) = 4.93]

CLASS	OLD CLASSIFICATION 1961 (Rs./m)	FOR APRIL 2014 (Rs./m)
I	100 & above	5090 & above
II	50-99	2545 - 5089
III	30-49	1527 - 2544
IV	15-29	764 – 1526
V	<15	< 764

ANNEXURE - 4



S.NO	ZONE	NAME OF THE ZONE	WARD NUMBER
1	I	THIRUVOTRIYUR	1 TO 14
2	II	MANALI	15 TO 21
3	III	MADHAVARAM	22 TO 33
4	IV	TONDIARPET	34 TO 48
5	V	ROYAPURAM	49 TO 63
6	VI	THIRU-VI-KA NAGAR	64 TO 78
7	VII	AMBATTUR	79 TO 93
8	VIII	ANNA NAGAR	94 TO 108
9	IX	TEYNAMPET	109 TO 126
10	X	KODAMBAKKAM	127 TO 142
11	XI	VALASARAVAKKAM	143 TO 155
12	XII	ALANDUR	156 TO 167
13	XIII	ADYAR	170 TO 182
14	XIV	PERUNGUDI	168,169 183 TO 191
15	XV	SOZHANGANALLUR	192 TO 200



— - Selected slums for the study

ANNEXURE 5

LIST OF SLUMS IN ZONE 5

S.NO	DIVISION	SLUM NAME	TOTAL POPULATION	CUMULATIVE POPULATION
1	**49**	**New Kamaraj Nagar**	**1178**	**1178**
2	49	Old Amaranjipuram	3988	5166
3	**50**	**Indira Nagar**	**892**	**6058**
4	50	Mgr Nagar	620	6678
5	50	Jeevarathinam Nagar	2907	9585
6	**50**	**A.J.Colony ***	**7303**	**16888**
7	**50**	**Palmarah Yard**	**7450**	**24338**
8	**51**	**Bishop Lane**	**958**	**25296**
9	**51**	**East Cemetry Road**	**5579**	**30875**
10	52	Anjaneya Nagar & O.S.H. Road	3000	33875
11	**52**	**Model Lane**	**2289**	**36164**
12	52	Chetty Thottam	1131	37295
13	**52**	**Meenakshiamman Pet**	**1500**	**38795**
14	**53**	**Bojarajan Nagar**	**6000**	**44795**
15	**53**	**Srinivasa Puram ***	**4000**	**48795**
16	**53**	**Canal Street**	**13010**	**61805**
17	53	Stanley Nagar	1742	63547
18	53	Adi Andhra Colony	585	64132
19	**53**	**Ramadoss Nagar**	**1500**	**65632**
20	**53**	**Pp Amman Koil Street**	**5000**	**70632**
21	54	Wood Warf Gate I & Ii	4000	74632
22	**55**	**Barracks Lane**	**563**	**75195**
23	56	Asirvadapuram	4210	79405
24	**56**	**Brn Garden**	**2500**	**81905**
25	56	Valluvar Nagar	1700	83605
26	**57**	**Kalyanapuram**	**4000**	**87605**
27	57	Jacca Puram	4575	92180

28	**58**	**Stringer Street**	**750**	**92930**
29	**58**	**Naval Hospital Road**	**2500**	**95430**
30	**59**	**S.M.Nagar**	**8000**	**103430**
31	59	Pallvan Nagar	1000	104430
32	59	Ellis Puram	800	105230
33	59	Muthusamy Salai	500	105730
34	59	Jamura Thottam	800	106530
35	60	Corporation Lane	1135	107665
36	**60**	**Adam Street**	**398**	**108063**
37	60	Annai Sathya Nagar Phase Ii	2500	110563
38	60	Annai Sathya Nagar C Part	2400	112963
39	61	Varadharaja Puram	1500	114463
40	**61**	**Transport Lane**	**600**	**115063**
41	61	Dr.Santhosh Nagar	3500	118563
42	61	Bhoopathy Nagar	400	118963
43	**62**	**Amma Nagar**	**1500**	**120463**
44	**62**	**Nedunchezhiyan Nagar**	**5000**	**125463**
45	62	Five Huts	750	126213
46	62	Cox Colony	1140	127353
47	**63**	**Lgn Road**	**2000**	**129353**
48	63	Border Thottam	1500	130853
49	63	South Coovum River Road	1000	131853
50	63	Goyyathope Tnscb	2000	133853
51	63	Karim Mohideen Sahib Street	500	134353
52	63	Veeran Puram	1000	135353

Slums marked in bold letters were the selected clusters for this study out of total clusters.

The slum marked with * = 2 clusters in that same slum. Totally 26 clusters selected for this study.

ANNEXURE 6

KEY TO MASTER CHART

Variable	Label	Coding
S.No.	Serial Number	1,2 etc
Household_no	Household Number	1,2 etc
Age	Age of the participant	1,2,3 etc
Sex	Sex of the participant	1=Male 2=Female
Religion	Religion	1= Hindu 2=Christian 3=Muslim 4= Others
HOF	Head of the family	1=Yes 2=No
Edu_part	Education of the participant	1=Illiterate 2=I-V 3=VI-X 4=XI-XII 5=Diploma 6=Degree 7=PG Degree 8=Others 9=Not yet gone to school
Occu_part	Occupation of the participant	1=Not working 2=Unskilled 3=Semi skilled 4=Skilled 5=Self-employed 6=Student 7=Semi professional 8=Professional
Monthly_inc	Total monthly income of the family	
Percap_income	Per capita income of the family	
Members	Total members of the family	1,2,3 etc
ses_bg	SE Scale as per BG Prasad classification	1,2,3,4,5
House_typ	Type of house	1= Kutcha 2=Semipucca 3=Pucca 4=Others
No_rooms	No.of rooms in the house	1,2,3,4
Overcrowding	Overcrowding	1=Yes 2=No
Sleep_same	Sleep in the same room	1=Yes 2=No
Water_srce	Source of water supply	1=Corporation water 2=Lorry water 3=Bore well 4=Hand pump 5=Well 6=Natural Water collection 7=Others
Wtr_fulfil	Is there sufficient water supply	1=Yes 2= No
Whr_bath	Place of bath	1=Bathroom 2=Near wells 3=Near pump 4=Near Water collections
Times_bath	Bathing frequency	1= Every day 2= alternate days 3= Weekly thrice 4=Weekly twice 5= Weekly once
use_soap	Use soap for bathing	1=Yes 2=No
hair_wash	Frequency of hair washing	1= Every day 2= alternate days 3= Weekly thrice 4= Weekly twice 5= Weekly once

hand_play	Wash hands after playing	1=Yes 2=No 3= Not applicable
hand_out	Wash hands after coming from outside	1=Yes 2=No
hand_bfmeal	Wash hands before eating	1=Yes 2=No
hand_afmeal	Wash hands after eating	1=Yes 2= No
Hand_bfcook	Wash hands before cooking	1=Yes 2=No 3= Not applicable
hand_afcook	Wash hands after cooking	1=Yes 2=No 3= Not applicable
hand_toilet	Wash hands after using toilet	1=Yes 2= No
oil_body	Apply oil to body	1=Yes 2= No
hair_oil	Apply oil to hair	1=Yes 2= No
shave	Place of shaving	1= Home 2= Barber shop 3=Not applicable 4= Both
wear_wshclo	Habit of wearing washed clothes daily	1=Yes 2= No
shr_comb	Habit of sharing comb with others	1=Yes 2= No
shr_towel	Habit of sharing towel with others	1=Yes 2= No
shr_blade	Habit of sharing blade with others	1=Yes 2= No 3= Not applicable
shr_soap	Habit of sharing soap with others	1=Yes 2= No
shr_dress	Habit of sharing clothes with others	1=Yes 2= No
undergarm	Habit of wearing undergarments	1=Yes 2= No
footwear	Habit of wearing footwear always	1=Yes 2= No
ftwr_type	Type of footwear	1=Closed shoes 2= Open shoes
nails	Cut nails at least once a week	1=Yes 2= No
pets	Do you have domestic animal in your house	1=Nil 2=Cow 3=Goat 4=Poultry 5=Dog 6=Cat 7=Others
dm	History of Diabetes Mellitus	1=Yes 2= No
ho_sk_dis	History of skin disease	1=Yes 2= No
sk_dis_symp	Symptom of skin disease	
fam_mem	Skin disease in family members	1=Yes 2= No 3=Don’t know
itch	Itching in the body	1=Yes 2= No
itch_whr	Site of itching in the body	
itch_nite	Is itching aggravated at night	1=Yes 2= No
itch_fammemb	History of itching in family members	1=Yes 2= No
med	History of drug intake	1=Yes 2= No
hygiene	Sum of general appearance from head to foot	1-13
scr_hyg	General appearance score	1=Poor 2=Fair 3=Good
skn_color	Colour of the skin	1=Ivory 2=Beige 3=Light brown 4=Medium brown 5=Dark brown 6=Very dark brown
skn_disease	Presence of preventable skin disease	1=Yes 2= No
impetigo	Impetigo	1=Yes 2= No
carbuncle	Carbuncle	1=Yes 2= No
intertrigo	Intertrigo	1=Yes 2= No
ecthyma	Ecthyma	1=Yes 2= No
tcap	Tinea capitis	1=Yes 2= No

tcarp	Tinea carporis	1=Yes 2= No
t_ung	Tinea unguium	1=Yes 2= No
scabies	Scabies	1=Yes 2= No
folliculitis	Folliculitis	1=Yes 2= No
leprosy	Leprosy	1=Yes 2= No
tped	Tinea pedis	1=Yes 2= No
tcrur	Tinea cruris	1=Yes 2= No
wart	Wart	1=Yes 2= No
molconta	Molluscum contagiosum	1=Yes 2= No
furuncle	Furuncle	1=Yes 2= No
tver	Tinea versicolor	1=Yes 2= No
tbarb	Tinea barbae	1=Yes 2= No
pediculosis	Pediculosis capitis	1=Yes 2= No
tfacei	Tinea faciei	1=Yes 2= No

ANNEXURE 7 - MASTER CHART

| S.No | Household_no | Age | Sex | Religion | HOF | Edu_Part | Occu_part | Monthly_inc | Percap_income | ses_bg | House_typ | No_rooms | Overcrowding | Sleep_same | Water_srce | Wtr_fulfil | Whr_bath | Times_bath | use_soap | hair_wash | hand_play | hand_out | hand_bfmeal | hand_afmeal | hand_bfcook | hand_afcook | hand_toilet | oil_body | hair_oil | shave | wear_wshclo | shr_comb | shr_towel | shr_blade | shr_soap | shr_dress | undergarm | footwear | ftwr_type | nails | pets | dm | ho_sk_dis | sk_dis_symp | fam_mem | itch | itch_whr | itch_nite | itch_fammemb | med | hygiene | scr_hyg | skn_color | skn_disease | impetigo | carbuncle | intertrigo | ecthyma | tcap | tcarp | t_ung | scabies | folliculitis | leprosy | tped | tcrur | wart | molconta | furuncle | tver | tbarb | pediculosis | tfacei |
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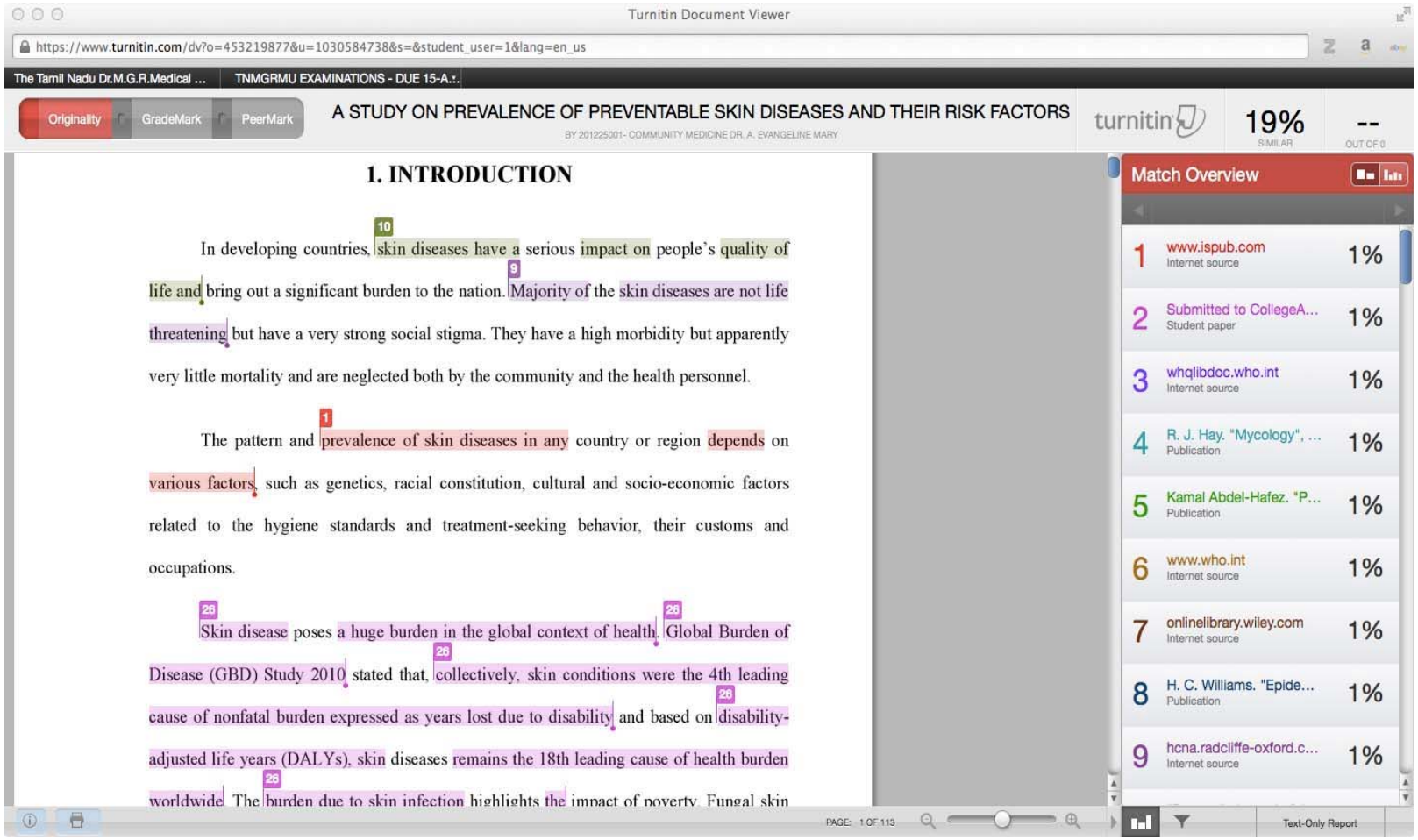
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In developing countries, skin diseases have a serious impact on people's quality of life and bring out a significant burden to the nation. Majority of the skin diseases are not life threatening but have a very strong social stigma. They have a high morbidity but apparently very little mortality and are neglected both by the community and the health personnel.
The pattern and prevalence of skin diseases in any country or region depends on various factors, such as genetics, racial constitution, cultural and socio-economic factors related to the hygiene standards and treatment-seeking behavior, their customs and occupations.
Skin disease poses a huge burden in the global context of health. Global Burden of Disease (GBD) Study 2010 stated that, collectively, skin conditions were the 4th leading cause of nonfatal burden expressed as years lost due to disability and based on disability-adjusted life years (DALYs), skin diseases remains the 18th leading cause of health burden worldwide. The burden due to skin infection highlights the impact of poverty. Fungal skin
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ANNEXURE 8

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1. INTRODUCTION

In developing countries, skin diseases have a serious impact on people's quality of life and bring out a significant burden to the nation. Majority of the skin diseases are not life threatening but have a very strong social stigma. They have a high morbidity but apparently very little mortality and are neglected both by the community and the health personnel.

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Preventable skin diseases

Poverty and disease are closely tied together in a vicious downward spiral, with each factor aiding the other. Many diseases that primarily affect the poor serve to deepen poverty and also worsen conditions. Poverty in turn, significantly reduces people capabilities making it more difficult to avoid poverty related diseases. WHO calls them "diseases of poverty" because they primarily affect the poor, and they also worsen poverty's toll.[2]

1

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ANNEXURE 9

INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE, CHENNAI-3

EC Reg No.ECR/270/Inst./TN/2013
Telephone No : 044 25305301
Fax : 044 25363970

CERTIFICATE OF APPROVAL

To
Dr. Evangeline Mary.A,
PG in Community Medicine,
Institute of Community Medicine,
Madras Medical College, Chennai-3.

Dear Dr. Evangeline Mary.A,

The Institutional Ethics Committee of Madras Medical College, reviewed and discussed your application for approval of the proposal entitled **"A study on prevalence of preventable skin diseases and their risk factors among households in selected slums of Chennai, Tamil Nadu – 2014"** No.24022014

The following members of Ethics Committee were present in the meeting held on 04.02.2014 conducted at Madras Medical College, Chennai-3.

1.	Dr. G. Sivakumar, MS FICS FAIS	-- Chairperson
2.	Prof. Kalaiselvi, MD Prof. of Pharmacology, MMC, Ch-3	-- Member Secretary
3.	Prof. Dr. K.Ramadevi, Director i/c, Instt. of Biochemistry, Chennai	-- Member
4.	Dr. Geetha Devadoss, Associate Professor of Pathology, MMC, Ch-3.	-- Member
5.	Prof. Dr. Sivasubramanian, I/c Director, Institute of Internal Medicine, MMC, Ch-3.	-- Member
6.	Thiru. S. Govindasamy, BABL	-- Lawyer
7.	Tmt. Arnold Saulina, MA MSW	-- Social Scientist

We approve the proposal to be conducted in its presented form.

Sd/Chairman & Other Members

The Institutional Ethics Committee expects to be informed about the progress of the study, and SAE occurring in the course of the study, any changes in the protocol and patients information / informed consent and asks to be provided a copy of the final report.

Member Secretary, Ethics Committee

MEMBER SECRETARY
INSTITUTIONAL ETHICS COMMITTEE
MADRAS MEDICAL COLLEGE
CHENNAI-600 003

ANNEXURE 10

From	To
The City Health Officer, Public Health Department, Corporation of Chennai, Ripon Building, Chennai- 600003.	Dr. V.V. Anantharaman, Associate Professor, Institute of Community Medicine, Madras Medical College, Chennai-600 003.

H.D.C.No.C1/ 7924 /2013 Date 29 .11.2013

Sir,

Sub: Corporation of Chennai – Public Health Department – Field study - Requisition for permission to conduct study in selected slums of Chennai assessing their health status – Orders issued – Reg.

Ref : 1.Letter from Dr. V.V. Anatharaman, Associate Professor, Institute of Community Medicine, Madras Medical College, Chennai-600 003, dt: 14.11.2013
2. Orders of the Deputy Commissioner(Health) dt:25.11.2013

****

As per the orders of the Deputy Commissioner(Health) in the reference second cited Dr. G.Jansi Vanitha Kumari, IIIrd year M.D, Dr. A. Evangelinemary, IIyear M.D, Dr. K.Kokila, IIIrd Year M.D, Institute of Community Medicine, Madras Medical College, Chennai-600 003 are permitted to do dissertation titled "A cross sectioned study of reproductive mortility amoung adolescent girls in the selected slums of Chennai 2013" and "A cross sectional study on preventable skin Diseases and their risk factors amoung households in selected slums of Chennai -2013" and "A study on prevalence of chronic kidney disease and its risk factors among adults in selected slums of Chennai -2013" and assessing their health status with the usual conditions as detailed below.

1) Corporations Names in all Publications and Corporation Health Officials as Co-Author.
2) Reports should be well informed to official of Health Department.
3) No Negative reporting about Corporation to be made.

City Health Officer

Dr. P. KUGANANTHAM
M.B.B.S., D.P.H., M.P.H., WHO FELLOW, DTM&H., F.I.S.C.D.
CITY HEALTH OFFICER
Public Health Department
Corporation of Chennai

CITY HEALTH OFFICER
29 NOV 2013
PUBLIC HEALTH DEPARTMENT

Copy Submitted to:
Deputy Commissioner (Health) office.

Copy to
The Zonal Officer, Zone I to XV.
The Zonal Health Officer, Zone I to XV.